PRODUCTIVITY OF ILLINOIS SOILS

CIRCULAR 1016

UNIVERSITY of ILLINOIS at URBANA-CHAMPAIGN
COLLEGE of AGRICULTURE
COOPERATIVE EXTENSION SERVICE

CONTENTS

This circular was written by R. T. Odell, Professor of Pedology, and W. R. Oschwald, Associate Professor of Soil Classification, Department of Agronomy. The authors are grateful to other members of the Department of Agronomy, to members of the Departments of Agricultural Economics and Forestry of the College of Agriculture of the University of Illinois at Urbana-Champaign, and to the Soil Conservation Service of the United States Department of Agriculture for useful suggestions, especially in the preparation of Table 5.

Urbana, Illinois — May, 1970

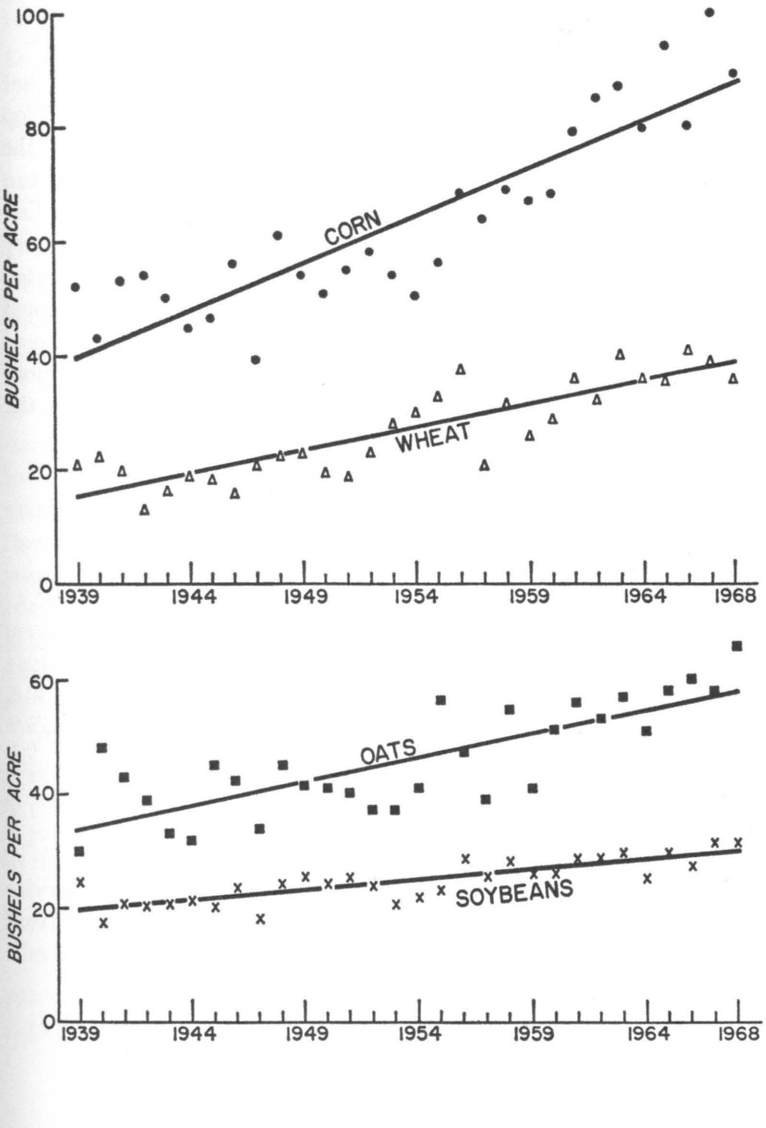
Issued in furtherance of Cooperative Extension Work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. JOHN B. CLAAR, *Director*, Cooperative Extension Service, University of Illinois at Urbana-Champaign.

12M—5-70—13971

The current technological revolution in agriculture, with large inputs of management and capital, has resulted in much higher crop yields, especially on those soils that are most responsive to management. The objectives of this publication are (1) to outline the major factors that cause differences in crop yields; and (2) to indicate the average yields of grain, forage, and tree crops that may be obtained on soil types in Illinois under specified levels of management. Correlative information concerning the properties and distribution of various soils in Illinois is published in county soil reports and Illinois Agricultural Experiment Station Bulletin 725, "Soils of Illinois."

CROP-YIELD TRENDS IN ILLINOIS, 1939-1968

From 1939 through 1968, crop yields in Illinois increased markedly, especially those of wheat and corn (Fig. 1). During this thirty-year period, yields of wheat, corn, and hay more than doubled, and yields of oats and soybeans increased more than 50 percent (Table 1). Much of the increase in wheat yields has been the result of improved varieties and fertilization with phosphorus and nitrogen. The greatest corn-yield increases have paralleled a rapid increase in the use of nitrogen during the past decade combined with more phosphorus, potassium, pesticides, and higher plant populations. The Illinois Cooperative Crop Reporting Service found that fertilizer was applied on 96 percent of the corn and wheat but on only 17 percent of the soybeans harvested in 1968 in the state. This is in line with research findings that soybeans can feed efficiently on residual fertility.



Trends of grain crop yields in Illinois, 1939-1968. Data from Illinois Cooperative Crop Reporting Service. (Fig. 1)

Corn

$Y = 38.26 + 1.64X$
$Syx = 7.68$

Oats

$Y = 32.93 + 0.84X$
$Syx = 5.99$

Wheat

$Y = 14.42 + 0.80X$
$Syx = 4.17$

Soybeans

$Y = 19.21 + 0.35X$
$Syx = 2.21$

The equation $Y = a + bX$ expresses the straight-line trend between years (1939-1968) and the average annual yield of each of the four crops. Assuming average weather, the estimated corn yield for any year $= 38.26 + 1.64 \times$ years after 1938. For example, the estimated corn yield for 1939 $= 38.26 + 1.64 \times 1 = 39.90$ bushels, and the estimated corn yield for 1968 $= 38.26 + 1.64 \times 30 = 87.46$ bushels. Crop yields can also be estimated from the trend lines. The standard error of estimate (Syx) indicates the scatter of average crop yields about the appropriate trend line. Note that the Syx for corn (7.68 bushels) and scatter of dots about its line are greater than the Syx for soybeans (2.21 bushels) and the other crops.

LIMESTONE AND FERTILIZER USE IN ILLINOIS, 1938-1968

The use of limestone on Illinois farms increased from 1.2 million tons in 1938 to nearly 5 million tons per year in four of the five years between 1963 and 1967 (Fig. 2). Limestone use from 1938 through 1967 has followed three general patterns. First, with the exception of 1943, when World War II was in progress, limestone use increased each year from 1938 through 1946. Limestone use in 1946 was four times greater than in 1938. Second, limestone use declined each year from 1946 (5.6 million tons) to 1953 (2.5 million tons). Third, limestone use since 1953 has increased each year except for 1955, 1959, 1964, and 1967. During these years, limestone consumption was lower than the preceding year. Although yield increases are often more dramatic with fertilizer than with limestone, the use of limestone on agricultural soils will continue to be important on Illinois farms.

Since 1938, fertilizer use in Illinois has been characterized by increased consumption of each of the "Big 3" — nitrogen, (N), phosphorus (P), and potassium (K). The tonnage of primary fertilizer nutrients sold in Illinois from 1938 through 1968 is given in Fig. 3. In addition to the increase in consumption of N, available P_2O_5, and K_2O, there has been a shift in the "mix" of the "Big 3" nutrients.

Nitrogen tonnage sold in Illinois increased from 1,078 tons of N in 1938 to nearly 600,000 tons in 1967 and 1968 (a 600 fold increase). The use of nitrogen increased slowly from 1938 until about 1950, and moderately between 1950 and 1962. Since 1962, there has been a rapid increase in nitrogen use (Fig. 3).

The tonnage of available P_2O_5 sold in Illinois increased from 4,053 tons in 1938 to 457,534 tons in 1968 — an increase of over 100 fold. This trend is similar to that for nitrogen except that available phosphorus tonnage increased more rapidly than nitrogen tonnage prior to 1950, and has increased more slowly than nitrogen since 1962. The tonnage of total P_2O_5 (available P_2O_5 and rock phosphate and other slowly soluble phosphorus sources) increased more rapidly than the tonnage of available P_2O_5 prior to 1953. The slowly soluble phosphorus sources accounted for two-thirds of the total P_2O_5 sold in Illinois in 1953, and for an even larger portion of the total P_2O_5 sold prior to 1953. In recent years, however, the available P_2O_5 tonnage has accounted for more than 90 percent of the total P_2O_5 sold in Illinois.

The trend in the sales of K_2O in Illinois has been nearly identical with the trend in sales of available P_2O_5 except that the tonnage of potassium increased more rapidly between 1950 and 1953 (Fig. 3).

The increased use of limestone and commercial fertilizer has resulted in greater crop production in Illinois. This increase in crop production is also a reflection of the large percentage of Illinois soils that respond to limestone, fertilizer, and other inputs of technology.

Proper use of pesticides also contributes to higher crop yields. In 1968, the Illinois Cooperative Crop Reporting Service estimated that 86 percent of the planted corn acreage and 61 percent of the soybean acreage received herbicide applications. According to estimates by the Illinois State Natural History Survey, 68 percent of the corn acreage was treated with insecticides. In addition, the use of adapted varieties, optimum plant populations, and improved tillage practices, timeliness of operation, and more efficient management have contributed greatly to the technological revolution.

LAND-USE TRENDS IN ILLINOIS

Of the nearly 36 million acres in Illinois, the proportion in farms declined slightly from 86.7 percent in 1939 to 83.7 percent in 1964, as approximately one million acres were shifted to other uses. The total acreage of cropland declined about the same amount during this period, but the acreage of all major grain crops except oats increased. Acres of soybeans more than doubled, and the increase in corn acreage nearly offset the decrease in oat acreage. According to the United States Census of Agriculture, land use in Illinois in 1939, 1954, and 1964 was as follows:

	Millions of acres		
	1939	*1954*	*1964*
Land in farms	31.0	30.4	30.0
Total cropland	25.1	23.7	23.9
Corn harvested for all purposes	7.8	9.0	9.5
Soybeans harvested for all purposes	2.6	4.0	5.6
Wheat harvested for grain	1.9	1.5	1.9
Oats harvested for grain	3.0	3.1	1.0

The Illinois Cooperative Crop Reporting Service indicates that corn acreage increased each year from 1964 to 1967, when it was slightly greater than 11 million acres. In 1968 corn acreage decreased to 10½ million acres. Soybean acreage increased to about 6 million acres in 1965, and then remained stable until 1968, when it increased to approximately 6½ million acres. Wheat acreage has remained about 1½ to 2 million acres annually since 1964. From 1964 to 1968, oat acreage declined to approximately 750,000 acres.

Table 1. — Increase in Yields per Acre of Selected Crops in Illinois, 1939-1968 (Data from Illinois Cooperative Crop Reporting Service)

	Corn	*Wheat*	*Oats*	*Soy-beans*	*Hay*
Average yield, 1939-1968 (bushels or tons)	63.6	26.9	45.9	24.6	1.8
Annual increase in yield, 1939-1968 (bushels or tons)	1.64	.80	.84	.35	.05
Annual increase in yield as a percentage of average yield	2.6	3.0	1.8	1.4	2.7
Estimated yield, 1939, from regression in Fig. 1 (bushels or tons)	39.9	15.2	33.8	19.6	1.2
Estimated yield, 1968, from regression in Fig. 1 (bushels or tons)	87.3	38.6	58.0	29.7	2.5
Estimated yield increase, 1939-1968 (bushels or tons)	47.4	23.4	24.2	10.1	1.3
Estimated percentage of yield increase, 1939-1968	119	154	72	52	108

Limestone applied to Illinois farms, 1938-1967. Data from National Limestone Institute. (Fig. 2)

FACTORS AFFECTING SOIL PRODUCTIVITY

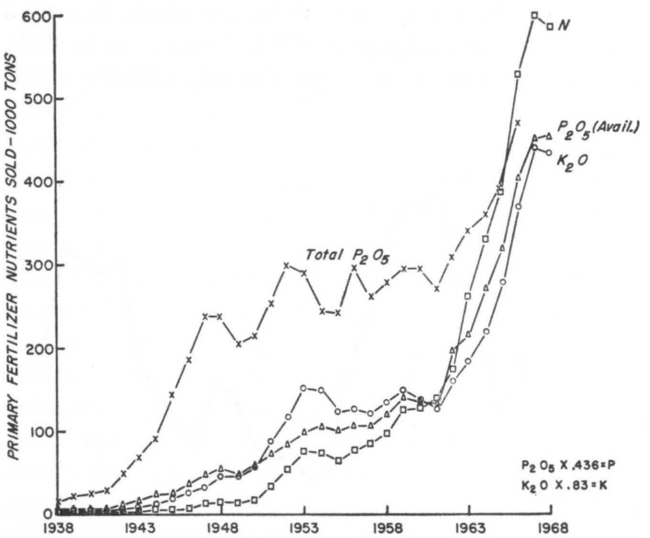
The pioneer farmer tilled with an ox-drawn wooden plow, planted seed by hand, and depended upon the natural fertility of the soil to provide his crop with needed plant nutrients. He could do little in the way of soil improvement, and was subject to the vagaries of the weather and its interaction with his crop-production system. The modern farmer is still subject to weather variation and its interaction with his management system, but he has technological tools that enable him to lessen the impact of unfavorable weather and to capitalize on near-optimum weather conditions. As a result of improved technology (fertilizers, new crop varieties, weed control, etc.), productivity of many soils is higher today than in pioneer times.

Soil productivity refers to the capacity of a soil to support plant growth. It is influenced by (1) soil properties; (2) climatic conditions; and (3) management inputs that are available for producing the crop. Each of these is discussed briefly below.

Soil Properties

Soils provide plants with nutrients, water, air, and space for growth and development. Soils vary in their capacity to provide these requirements in large enough quantities and at rates fast enough for economic crop production. Soil-management practices such as the application of limestone and commercial fertilizer, supplemental drainage, and erosion control are used to improve a soil's capacity for providing one or more of these requirements. Soil characteristics determine the need for as well as the effectiveness of soil-management practices.

Three groups of soil characteristics determine the capacity of a soil for crop production. Soil-profile characteristics determine the soil's ability to supply nutrients, water, air, and space for the development of the plant root system. Characteristics of topography and the soil's pattern of occurrence with associated soils determine the extent that soil-management practices can be applied to improve soil productivity. The effect of nutrient-supplying power, air-water relationships, and rooting volume on soil productivity are discussed briefly in this section. More detailed information on soil profiles and topographic characteristics, as well as soil patterns, is included in recent soil-survey reports, and in Illinois Agricultural Experiment Station Bulletin 725, "Soils of Illinois." Information on the availability of these publications can be obtained at the office of your county extension adviser.



Primary fertilizer nutrients sold in Illinois, 1938-1968. Data from Department of Agronomy and Illinois Cooperative Crop Reporting Service. (Fig. 3)

Nutrient-supplying power

Nutrient-supplying power is the capacity of a soil to provide sufficient quantities of nutrients fast enough to meet plant demands. "High-supplying power" for a nutrient indicates that yield increases from applications of the nutrient are likely to be small; "low-supplying power" indicates that large yield increases are probable. The nutrient-supplying power is influenced by the organic and mineral composition of the soil.

Organic matter serves as a source of nitrogen, phosphorus, sulfur, and other nutrients. These nutrients are made available to plants through bacterial decomposition of the organic matter. Soils that are relatively high in organic matter (dark-colored surface layers) have larger stored supplies of these nutrients than soils relatively low in organic matter (light-colored surface layers). Organic matter is a "binding agent" that helps hold the mineral soil particles together in aggregates and reduces the tendency of surface layers to crust. Organic matter also has a high water-holding capacity.

Some nutrients are stored in the mineral matter of the soil. They become available for use by plants through physical and chemical activities in the soil. The mineral matter of soils is determined by the soil parent material and by how much this material has weathered. Soils in Illinois that have developed from silty, windblown loess are usually higher in phosphorus than those developed from unsorted glacial till that is often compact. The quantity of nutrients in a soil is not constant but changes over time. Physical and chemical weathering not only releases nutrients such as potassium from the soil minerals but also makes the nutrients more susceptible to removal as water moves through the soil. Soils that are highly weathered are likely to have lower nutrient-supplying power than those that have undergone only slight to moderate weathering.

The evaluation of the nutrient-supplying power of a soil includes consideration of the distribution of available nutrients throughout the profile, the presence of conditions that may interfere with nutrient uptake, and the depth to which plant roots penetrate and obtain nutrients and moisture from the soil. These factors influence the efficient use of fertilizers as well as the soil's nutrient-supplying power. Fertilizer use is an important factor in obtaining high crop yields. Current suggestions for increasing crop yields through fertilization are given in the Illinois Agronomy Handbook.

Air-water relationships of soils

The ability of a soil to store and supply water and air for use by plants depends upon its water-holding capacity and the ease with which water moves into and through the soil profile. Soils that are high in productivity have a high capacity for holding plant-available water. Removal of excess water is necessary to prevent waterlogged conditions that limit crop growth as a result of lack of air.

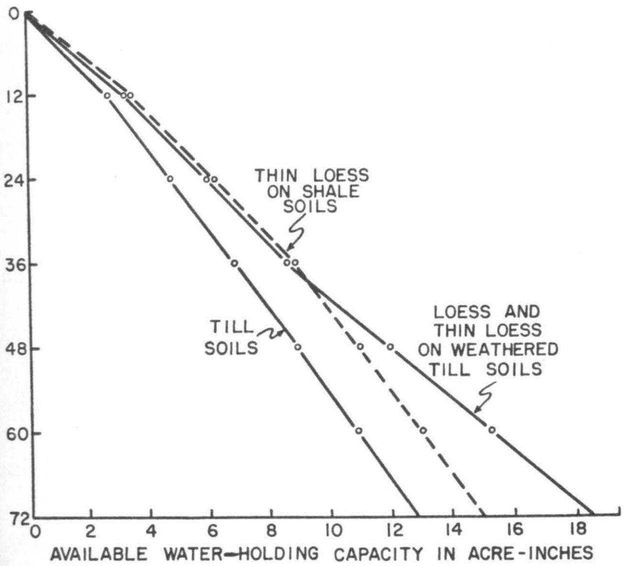
Plants need moisture regularly and in especially large quantities during the peak of the growing season, but rain falls irregularly. For this reason, it is important that moisture is stored in soils for use by plants during rainless periods. Soils differ markedly in their total moisture-holding capacity and in their plant-available moisture. Total moisture-holding capacity increases with decreasing size of soil particles, but *available* soil *moisture-holding capacity* increases with increasing silt content. Common ranges of total and available moisture-holding capacity for different soil textures are as follows:

Soil texture	*Inches of moisture-holding capacity per inch of soil*	
	Total	*Available*
Sandy	<.15	<.10
Loamy	.15-.25	.10-.20
Silty	.25-.35	.20-.30
Clayey	.35-.50	.15-.25

The depth of root penetration and *volume of soil that is permeated by roots* influence the amount of moisture and nutrients that plants can obtain from soils. Corn, wheat, and alfalfa roots regularly extend to depths of 5 or 6 feet in permeable soils such as Muscatine silt loam that have favorable moisture and air relationships. Soils that can hold 2 to 3 inches of plant-available water per foot to a depth of 5 to 6 feet are more drouthtolerant than those that can hold 1 to 2 inches of plant-available water per foot or that have root systems restricted to the top 2 to 3 feet of the soil. The cumulative water-holding capacity of some Illinois soil groups is given in Fig. 4. These soil groups differ from one another in the texture and compactness of the surface, subsoil, and substratum horizons. These soil properties influence the water-holding capacity and other soil-water relationships.

The natural drainage and aeration of a soil is related to the downward flow of water through the profile and its replacement by air, and indicates the degree that a soil is saturated with water under natural conditions. Tile and surface drainage systems can be used to improve the natural drainage of many soils. The extent to which a soil can be drained effectively depends upon the rate of water movement through the profile.

Soil permeability refers to the rate of water movement through the soil profile. Water moves through the soil in the larger soil pores as a result of the force of gravity. The permeability of the soil profile is influenced by the size distribution of the soil pores. The texture and structure of each horizon determine the size distribution of the pores. Water moves slowly in soils with a high proportion of small pores, but moves rapidly through soils with a high proportion of large pores. A distribution of about 50 percent large pores, for removal of excess water, and 50 percent small pores, for storing water for use by plants, is desirable, and is a characteristic of productive soils. The



Cumulative water-holding capacity, with depth, of soil groups studied. From article by J. B. Fehrenbacher, B. W. Ray, and J. D. Alexander in *Illinois Research,* Spring, 1967. (Fig. 4)

ease of water movement in the top 3 to 5 feet of the soil influences the wetness hazard and determines the kind of drainage system (tile or surface drainage) that will be effective. As permeability decreases, less water can drain through a profile and more will run off of sloping soils, influencing the susceptibility of soils to erosion. Root penetration is also restricted in soils that have slow or very slow permeability.

The soil properties that influence a soil's water-holding capacity and permeability are permanent in nature and are not easily changed by man. However, fertilization and other soil-management practices may increase the rooting depth of plants so that they obtain more nutrients and moisture from the soil profile.

Rooting volume

Physical and chemical characteristics influence the air-water relationships and the nutrient-supplying power of soils. These characteristics also influence the volume of soil that is permeated by the roots of plants. Soils that have profiles easily permeated by plant roots are usually productive or can be made productive with proper management, especially if they are not drouthy.

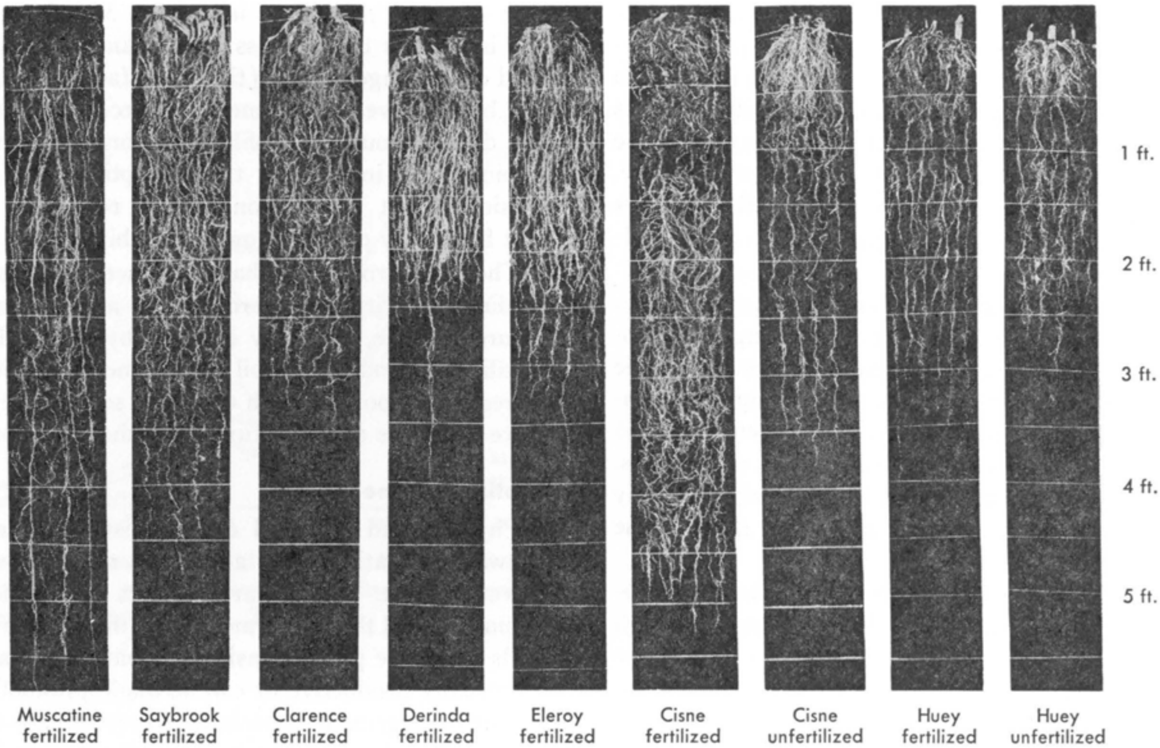
Corn-root development in some Illinois soils is shown in Fig. 5. In Muscatine, a soil that is free of root restrictive layers, roots penetrated to nearly 6 feet. Penetration was restricted to about 4½ feet in Saybrook, a soil that has calcareous loam till at a depth of about 3 feet. Root penetration was restricted to about 3 feet in the Clarence soil by calcareous glacial till. The till is high in clay and very compact. High-lime, silty clay shale restricted corn roots in Derinda and Eleroy soils.

A comparison of fertilized and unfertilized root systems illustrates the effect of fertilizer on improved root development in soils such as Cisne (Fig. 5). Cisne and some other soils have an ashy gray A_2 horizon with platy structure at a depth of about one foot. Root development is often restricted in this layer, and is more extensive above and below the A_2 horizon.

Huey is a problem soil that occurs in association with Cisne and some other soils in south-central Illinois. Huey has a high sodium content in the subsoil that causes dispersion of the clay particles and an unfavorable environment for roots. Root penetration was restricted to about 2½ feet in unfertilized Huey and to about 3½ feet in fertilized Huey.

Soil properties influence the root development of field crops other than corn. An excellent article on root development in some Illinois soils was published by Fehrenbacher, Ray, and Alexander of the University of Illinois Department of Agronomy in the Spring, 1967 issue of *Illinois Research.*

Other soil properties in addition to those mentioned above can influence root development. A high water



Penetration of corn roots in seven soil types. From article by J. B. Fehrenbacher, B. W. Ray, and J. D. Alexander in *Illinois Research,* Spring, 1967. (Fig. 5)

table, for example, will limit the development of the root system in most crops commonly grown in Illinois. Climatic conditions, tillage, and other management practices also influence root development.

Other soil factors

Characteristics of the topography and pattern of associated soils influence the suitability of soils for crop production. Topography, for example, influences water intake, soil erosion, and the efficiency of machine operations. Uniformity of the topography and the complexity of the pattern of soils may determine the extent to which technology can be used in crop production and thus influence the "real" productivity of a soil.

Soil productivity is not only influenced by properties of the soil profile and the landscape in which the soil occurs but also by climatic conditions and management inputs.

Climatic Conditions

As a result of unusual weather conditions or soils with serious limitations, crop yields may vary greatly from year to year. Annual variations in yield of 20 percent above or below 10-year averages are common, and greater variations sometimes occur under unusual weather conditions or on soils with serious limitations. However, longtime averages, which include favorable and unfavorable years, provide a basis for soil-productivity estimates.

Annual rainfall ranges from 30 to 32 inches per year in northern Illinois to 44 to 46 inches in parts of extreme southern Illinois. During the warm season (April through September), the average rainfall over most of Illinois is from 20 to 24 inches, or about 3½ inches per month. July and August are peak water-use months. For example, 6 to 7 inches of water may be returned to the atmosphere through evaporation from the soil and transpiration from plants during the month of July. This points to the importance of soil-stored moisture in years with low or poorly distributed rainfall.

The average freeze-free season varies from 160 days in extreme northern Illinois to 200 days in the southern tip of the state. The average date of the first freeze in the fall ranges from about October 5 in northern Illinois to later than October 30 in extreme southern Illinois; the average date of the last freeze of the spring is usually May 5 or later in northern Illinois and before April 5 in extreme southern Illinois.

Annual rainfall, seasonal distribution, length of growing season, and freeze dates are factors in the macroclimate that cause variation in soil productivity in different geographic areas. Microclimate, or the climate of a small area, often contributes to yield variation on different soils within a field.

For example, rainfall may run off a sloping soil so that less water is stored in the soil. Lower crop yields are the end result. The runoff water may accumulate on low-lying or depressional soils and result in lower yields in wet years and higher yields in dry years than on more sloping soils.

The direction a slope faces also influences the microclimate. Slopes facing south receive more solar radiation in the spring and summer. They are more likely to warm quicker and dry faster than north-facing slopes in the same area. The southern exposures are more likely to be subject to drouth, but may offer opportunities for early marketing of specialty crops.

Crops vary in their climatic adaptation and in their tolerance of climatic extremes. Some crops such as corn and soybeans have wide climatic adaptation, although specific varieties have been developed for specific climatic zones. Oats, on the other hand, yield better in northern Illinois where spring and early summer temperatures are cooler. Forage crops also vary in their adaptability to different soil-climate situations in Illinois.

Climatic conditions have a large direct and indirect influence on soil productivity. The interactions of soil, plant, and climate are important in evaluating soil productivity. They are also important in determining the response to management inputs.

Management Inputs

The third important influence on soil productivity is the application of management inputs or technology (materials, machines, and methods developed through research and industry). The increase in the use of limestone and fertilizer is one example (Figs. 2 and 3). The shifts in land use that took place between 1939 and 1968 (see pages 2 and 3) were related to the development of technology that made the shifts possible.

The development and application of new technology have been especially dramatic in corn production. In the late 1930's, the adoption of hybrid corn and mechanization of corn harvesting represented one of the first major breakthroughs in modern corn production. This was followed in the early 1950's by the substitution of fertilizer nitrogen for nitrogen from manure and legumes. During the 1950's, effective herbicides were developed and permitted reduction in the amount of necessary tillage.

In the 1960's, the application of technology expanded at a nearly explosive rate. Low-cost nitrogen, earlier planting, narrower rows, higher population, improved corn hybrids, more powerful machinery, and more selective herbicides are only a few of the developments that have become common practices on many Illinois farms.

The development of technology for other crops has also had a significant effect on soil productivity. The current Illinois suggestions for management inputs are summarized in the Illinois Agronomy Handbook.

Soil productivity varies in different areas of Illinois because of differences in soils, climate, and the capacity of soils to respond to management. The University of Illinois agronomy fields provide an excellent basis for examining the long-term productivity of Illinois soils and for estimating the response of various soils to improving technology.

Crop yields at representative agronomy fields

For many years, the Department of Agronomy has conducted field experiments to study the effects of limestone, rock phosphate, potassium, crop residues, and animal manure on crop yields. Crop varieties, hybrids, plant population, and date of planting have changed with time. Until recent years, however, when new fertility treatments were introduced at a number of locations in the state, fertility treatments remained constant. The long-term fertility treatments provide an excellent measure of the relative productivity of a number of extensive Illinois soil types. Characteristics of the soils at each location are indicated in Table 2. Crop-yield data are summarized in Table 3.

On untreated plots, corn yields have averaged from less than 30 bushels per acre at Oblong to 85 bushels per acre at Aledo. Except at Oblong, the highest long-time corn yields were on the manure-limestone-phosphate (MLP) plots at the locations where this treatment was included. MLP corn yields averaged more than 100 bushels per acre on the permeable soils at Aledo, Dixon, and with the corn-oats-clover rotation at Urbana, but were lower on soils with slower permeability at Carlinville, Oblong, Joliet, and Toledo. About 50 percent of the plot area at Toledo is Huey silt loam — a "slick-spot" with restricted rooting (Fig. 5).

The oldest soil-fertility plots in the United States are the Morrow Plots at the Urbana-Champaign campus of the University of Illinois. The basic soil treatments on these plots were no treatment versus manure, limestone, and phosphorus. The treatments on the Morrow Plots were modernized after the 1954 crop year. Since 1955, 200 pounds of nitrogen per acre have been applied on some of the corn plots. P-1 soil-test levels have been maintained at 40 to 50, and K soil-test levels at 240 to 300. Since 1955, when the old MLP plots were supplemented with nitrogen, superphosphate, and potassium, corn yields have averaged 124 bushels per acre with continuous corn, and 132 bushels per acre with a corn-oats-clover rotation (Table 3).

Average corn yields, 1965 through 1968 (except for 1966 through 1968 at Carlinville), ranged from 117

Table 2. — Characteristics of Soil Series From Representative Agronomy Fields

Location	*Soil series*	*Surface color*	*Natural drainage and aeration*	*Profile permeability*	*Available water-holding capacity in root zone*	*Rooting depth*	*Nutrient-supplying power*	
							P	*K*
					(inches)	(inches)		
Aledo	Sable	dark	poor	moderate	10–12	48–60	medium	high
Carlinville	Harrison	dark	good	moderately slow	10–12	48–60	medium	high
	Herrick	dark	somewhat poor	moderately slow	10–12	48–60	high	medium
	Virden	dark	poor	moderately slow	10–12	48–60	medium	medium
	Cowden	mod. dark	poor	slow	8–10	36–48	medium	low
Dixon	Muscatine	dark	somewhat poor	moderate	12–16	60–72	high	high
	Tama	dark	good	moderate	12–16	60–72	high	high
Joliet	Elliott	dark	somewhat poor	moderately slow	8–10	36–48	low	high
Oblong	Cisne	mod. dark	poor	very slow	8–10	36–48	medium	low
Toledo	Cisne	mod. dark	poor	very slow	8–10	36–48	medium	low
	Huey	light	poor	very slow	6–8	24–36	low	low
Urbana (MII plots)	Proctor	dark	good	moderate	10–12	48–60	medium	high
Urbana (Morrow plots)	Flanagan	dark	somewhat poor	moderate	12–16	60–72	medium	high

bushels per acre at Oblong to 150 bushels per acre at Dixon on plots that received the new treatments of 180 pounds of N, 60 pounds of P_2O_5 (26 pounds P), and 80 pounds of K_2O (66 pounds K) per acre. The yields from the updated treatments outyielded the best longtime treatments as follows: Aledo, 35 percent; Carlinville, 50 percent; Dixon, 40 percent; Oblong, 35 percent; and Toledo, 90 percent. The new treatments, which began in 1965, have not been in effect long enough to fully evaluate their effectiveness.

Longtime average soybean yields are available from Carlinville, Joliet, Oblong, Toledo, and Urbana (Table 3). The average yields have ranged from 13 to 22 bushels per acre for the untreated plots, 16 to 28 bushels per acre for the RL treatment, 25 to 32 bushels per acre for the MLP treatment, and 24 to 30 bushels per acre for the RLPK treatment. The yield increases for the longtime fertility treatments over the untreated check plots have been smaller for soybeans than for corn, oats, or wheat. Soybean yields for the new fertility treatments, which began in 1965, were higher than the longtime average yields from the RLPK plots at Carlinville, Oblong, and Toledo.

Longtime average wheat yields have ranged from 5 bushels per acre on the untreated plots at Oblong to 42 bushels per acre for the RLPK treatment at Dixon. The longtime fertility treatments reported in Table 3 were short in soluble phosphorus — a particularly important element in wheat fertilization. Shorter, stiffer-strawed varieties and effective use of nitrogen and soluble phosphorus should result in wheat yields nearly double those obtained with the MLP and RLPK treatments, as shown in Table 3 for Carlinville.

Oats were included in the cropping systems at Aledo, Dixon, Joliet, and Urbana. Average yields varied from 45 to 62 bushels per acre for the O and RL treatments, and from 68 to 76 bushels per acre for the MLP treatments. The RLPK yields were in the 61- to 68-bushel range. Newer high-yielding varieties and effective fertilizer use, along with more attention to seeding practices, are management inputs that should help raise oat yields well above the longtime average MLP yields, as shown by the 80-bushel per acre average on the MLP + NsPK plots at Urbana.

Corn-yield variability

How do corn yields vary from year to year? Are corn yields more variable on some soils than on others? What effect does soil treatment have on year-to-year yield variability?

The agronomy field data that provided the longtime average crop yields were analyzed to help evaluate corn-yield variability. The long-term effect was removed through statistical analysis. Yield variation, expressed as a percent of the mean yield for each treatment, was calculated for the treatments at the representative agronomy fields (Table 4). The percentages in Table 4 express the year-to-year variation from the average corn yields given in Table 3.

Corn-yield variation — in terms of departure from the average — is greatest at Toledo and Oblong. The yield variation at Toledo ranged from approximately 44 percent for the MLP and RLPK plots to 65.2 percent for the untreated plots. The wide variation in yields is due to the high percentage of "slick-spot" soils (Huey silt loam) on the Toledo field. Severe crop-yield reductions result if weather conditions are either too wet or too dry.

Soils that are more nearly ideal for corn production, such as those at Aledo, Dixon, and Urbana have year-to-year corn-yield variability of 14.1 to 24.2 percent, with the lowest variation occurring on the MLP and RLPK plots. The MLP plot at Dixon had the smallest variation.

It is probable that the newer fertility treatments, along with other technological inputs, will further reduce yield variability. As a result, modern crop producers are less subject to the vagaries of the weather. It is also probable that those soils and locations with the smallest yield variations with the old soil treatments will have even less yield variability with the newer crop-production techniques.

PRODUCTIVITY OF SOIL TYPES IN ILLINOIS

Crop Yields

Soils differ markedly in their properties, adaptation, and ability to produce various crops. Differences in soil productivity are often expressed in physical units (such as bushels, tons, board feet, etc.) in which yields of the various crops are measured. Yields of selected grain, forage, and tree crops are given in Table 5 for the correlated soil types in Illinois under *basic* and *high* levels of management. Management is so important and the range is so wide that it must be defined for crop yields or other measures of soil productivity to be meaningful. The characteristics of the two levels of management used in Table 5 are discussed below.

The crop yields in Table 5 for bottomland soils are for areas that are not flooded periodically. Yields are lower on areas subject to flood damage, depending upon the frequency, duration, and season of flooding.

Basic Management Level

Most soils require some treatment before economical crop production is possible. Improvement of drainage on poorly drained soils and application of limestone on highly acid soils are examples. Investments for improvements such as these are capitalized into land values. In a sense, the improvements become a part of the soil, although requiring periodic maintenance.

The basic level of management includes partial drainage, but additional drainage is needed for optimum production. Limestone applications have been sufficient to maintain a soil pH of 6.0 to 6.5. Available phosphorus levels are maintained at a P-1 test of 10 to 15. Available potassium levels are maintained at 125 to 150 on soils with low potassium-supplying power and 200 or more on soils with medium and high potassium-supplying power. Nitrogen levels have been equivalent to the legume contribution in a corn-soybeans-wheat (or oats)-meadow cropping sequence, or approximately 50 to 75 pounds per acre per year of corn. Crop residues or their equivalent have been returned to the soil. Plant populations for corn have been 12,000 to 14,000 plants per acre. Erosion-control practices have not been adequate to control soil losses within tolerances considered necessary to prevent serious soil damage. Weed and insect control and tillage operations often lack timeliness.

Longtime average crop yields from the residue-limestone plots at the Illinois agronomy fields (Table 3) were used as the basis for yield estimates for benchmark soils such as Sable, Muscatine, Flanagan, Herrick, Elliott, and Cisne. Recent soil test levels for pH, available phosphorus, and available potassium at the agronomy fields were in the ranges described above.

High-Management Level

The high-management level is based on high-input levels thought to be near those required for maximum profit. This level is based on present technology, and is used by about 10 percent of the farmers.

High-level management includes drainage improvements consistent with soil properties and economic relationships. Limestone applications have been sufficient to maintain a soil pH of 6.0 or above for cash grain-cropping systems, and a pH of 6.5 for cropping systems with alfalfa or clover. Available phosphorus (P-1) test levels have been maintained at 40 to 50, and available potassium test levels at 240 or higher. Nitrogen has been applied at the rate of 125 to 175 pounds per acre per year of corn (or the equivalent from legumes and manure). Crop residues have been returned. Corn plant populations have been 20,000 to 24,000 stalks per acre (lower for drouthy soils). Erosion-control practices have held soil losses below amounts considered to cause serious soil damage. Weed and insect control have been adequate and timely. Tillage operations have been fitted to the soil and requirements of the crop. Excessive tillage has been avoided. High-yielding, good-standing crop varieties are used. Timely harvesting and other crop-production operations are carried out as conditions permit. Flexibility is maintained in the crop-production system so that adjustments can be made for changes in climatic conditions and the economic situation.

High-management yield levels are based on recent yields obtained at high-input levels at agronomy fields and research centers in Illinois (Table 3).

Table 3. — Average Crop Yields From Representative Illinois Agronomy Fields (Data From Department of Agronomy)

Treatment[a]	*Years*	*Average annual yield per acre*			
		Corn	*Soybeans*	*Wheat*	*Oats*
			(bushels)		
Aledo					
O	1938–67	85	. .	19[b]	58
RL	1938–67	87	. .	29[b]	54[c]
MLP	1938–67	110	. .	. .	73
RLPK	1938–64	92	. .	33[d]	67
180+60+80	1965–68	146	43	. .	. .
Carlinville					
O	1938–65	54	22[e]	16[f]	. .
RL	1938–65	75	28[e]	26	. .
MLP	1938–65	94	32[e]	38[f]	. .
RLPK	1938–65	91	30[e]	35[f]	. .
180+90+120	1966–68	140	45	59[g]	. .
Dixon					
O	1938–67	68	. .	26	50
RL	1938–67	89	. .	32	62
MLP	1938–67	106	. .	40	76
RLPK	1938–64	99	. .	42[h]	68[i]
180+60+80	1965–68	150	43	. .	. .
Joliet					
O	1938–61	40	22	20	50
RL	1938–61	54	25	21	53
MLP	1938–61	81	27	34	68
RLPK	1938–61	74	29	33	61
Oblong					
O	1938–67	28	13	5	. .
RL	1938–64	59	17	28	. .
MLP	1938–67	85	25	34	. .
RLPK	1938–64	88	25	27	. .
180+60+80	1965–68	117	34	. .	. .
Toledo					
O	1938–67	31	14[j]	13	. .
RL	1938–67	48	16[j]	22	. .
MLP	1938–67	64	25[j]	33	. .
RLPK	1938–64	62	24[j]	30	. .
180+60+80	1965–68	121	27	. .	. .
Urbana (Mll Plots)					
R	1946–67	64	23	14	. .
RLPK	1946–67	95	30	30	. .
RLPKN	1946–67	100	30	32	. .
RLsPKN	1946–67	101	31	40	. .
Urbana (Morrow Plots — continuous corn)					
O	1938–68	31	. .	. .	. .
MLP	1938–68	75	. .	. .	. .
MLP+NsPK	1955–68	124	. .	. .	. .
Urbana (Morrow Plots — corn-oats-clover)					
O	1938–67	66[k]	. .	. .	45[k]
MLP	1938–67	115[k]	. .	. .	70[k]
MLP+NsPK	1955–67	132[l]	. .	. .	80[l]

[a] O = untreated; R = crop residues returned; M = manure; L = limestone; P = rock phosphate; sP = super phosphate; K = potash; N = nitrogen; figures for 1965-68 and 1966-68 treatments indicate pounds per acre of N + P_2O_5 + K_2O.

[b] 1939-64; [c] 1939-63; [d] 1938-65; [e] 1942-65; [f] 1942-66; [g] 1967-68; [h] 1938-63; [i] 1938-62; [j] 1947-67; [k] 11 crops; [l] 5 crops.

Soil-Productivity Indexes

For some purposes it is useful to express the productivity of different soils in relative units, such as index numbers that are calculated from an established base. Several crops can be combined into one productivity index. Productivity indexes measure relative response to management, and facilitate comparisons between broad groups of crops and between soil productivity and economic measures, especially for land evaluation. Crop-yield levels change from year to year because of weather and factors affecting trends, but the relationships among soils, as indicated by indexes, remain relatively stable.

Table 4. — Corn-Yield Variation for Long-Term Fertility Treatments at Representative Illinois Agronomy Fields, 1938-1967

Location	*Corn-yield variation (percent of average yield)*					
	O	*RL*	*MLP*	*RLPK*	*RLPKN*	*RLsPKN*
Aledo	22.9	19.3	16.6	18.9[a]	....	....
Carlinville	29.4[b]	27.0[b]	22.7[b]	22.3[b]	....	....
Dixon	24.2	21.2	14.1	16.9[a]	....	....
Joliet	23.8[c]	20.5[c]	16.8[c]	16.0[c]	....	....
Oblong	64.5	28.7[a]	26.5	27.3[a]	....	....
Toledo	65.2	53.1	43.6	44.0[a]	....	....
Urbana (Mll plots)	18.8[d, e]	....	....	21.4[d]	19.7[d]	20.5[d]

[a] 1938-64; [b] 1938-65; [c] 1938-61; [d] 1946-67; [e] Residues returned.

Productivity indexes for grain crops and forage crops are given in Table 5 for the correlated soil types in Illinois under basic and high levels of management. Under the basic level of management, a group of the more productive soils in Illinois, such as the Muscatine, Sable, and Flanagan series, have produced approximately the following yields per acre from 1938 through 1967: corn, 90 bushels; soybeans, 30 bushels; wheat, 30 bushels; oats, 60 bushels; alfalfa hay, 3.5 tons; and mixed pasture, 175 days per animal unit. These are used as "base yields" (index = 100) in calculating the productivity indexes for grain crops, and as standards for estimating yields and productivity indexes for forage crops.

The productivity indexes for *grain crops* are calculated from the crop yields expressed as a percent of the "base yields" given above. These percentages are then weighted according to the relative acreage that each grain crop makes up of the total acreage of the four principal grain crops in Illinois. In southern Illinois, corn composes 40 percent, soybeans 40 percent, wheat 20 percent, and oats zero percent of the total acreage. In central and northern Illinois, corn accounts for 55 percent, soybeans 30 percent, wheat 8 percent, and oats 7 percent of the total acreage.[1]

[1] These percentages are based upon data from the 1964 U.S. Census of Agriculture. Southern Illinois comprises 36 counties in areas E, F, O, P, Q, and R on the "General Soil Map of Illinois" in Illinois Agricultural Experiment Station Bulletin 725. Central and northern Illinois include all other areas on the "General Soil Map of Illinois." These areas comprise 71.6 percent of the state in 66 counties.

According to the 1964 U.S. Census of Agriculture, 52 percent of the land in farms and 70 percent of the cropland in southern Illinois were used for grain crops, and 63 percent of the land in farms and 77 percent of the cropland in central and northern Illinois were used for grain crops. Since the relative importance of the four grain crops differs in southern Illinois from the remainder of the state, different weights are used in determining the productivity indexes for the southern and for the central and northern sections of the state. The calculated indexes are then rounded to the nearest multiple of 5. Examples of this method of calculating the productivity index for grain crops under a high level of management are given below for Ava silt loam and Saybrook silt loam. When calculated indexes are rounded to the nearest multiple of 5, the productivity indexes are 95 for Ava silt loam and 140 for Saybrook silt loam for grain crops under a high level of management.

		Ava silt loam (No. 14) (Southern Illinois)			
Line number		*Corn*	*Soybeans*	*Wheat*	*Oats*
1	Estimated yield with high level of management (bushels)	77	28	38	..
2	Base yield (index = 100)	90	30	30	..
3	Line 1 ÷ line 2	85.6	93.3	126.7	..
4	Weight according to acreage (percent)	40	40	20	0
5	Line 4 × line 3	34.2	37.3	25.3	0
6	Weighted productivity index for high level of management (sum of line 5)		96.8		

		Saybrook silt loam (No. 145) (Central and northern Illinois)			
Line number		*Corn*	*Soybeans*	*Wheat*	*Oats*
1	Estimated yield with high level of management (bushels)	121	42	52	76
2	Base yield (index = 100)	90	30	30	60
3	Line 1 ÷ line 2	134.4	140.0	173.3	126.7
4	Weight according to acreage (percent)	55	30	8	7
5	Line 4 × line 3	73.9	42.0	13.9	8.9
6	Weighted productivity index for high level of management (sum of line 5)		138.7		

Since the yields and productivity indexes for *forage crops* are based upon fewer data, these indexes are less reliable than those for grain crops. One ton of hay is equivalent to approximately 50 days of pasture for one cow (one animal unit). "Mixed pasture" refers to mixtures of legumes and grasses (alfalfa, bromegrass, etc.) that are best adapted to the various soils and climatic conditions.

Comparison of the crop yields and productivity indexes for the high level of management with those for the basic level of management indicates the response of that soil to management. It should be recognized, however, that inputs such as fertilizer, etc. necessary to achieve greater yields and productivity indexes under a high level of management vary greatly from one soil to another. For example, the inputs necessary to achieve high-level management are greater on Ava silt loam than on Saybrook silt loam, even though the response of Ava silt loam is less because of a fragipan that limits root proliferation in the lower subsoil (Table 5). In general, the response to management is greater on medium-textured soils with moderate permeability (where moisture and air relations are usually favorable) than on fine-textured, slowly permeable soils where excess moisture often occurs, or on steep or coarse-textured soils where moisture is often deficient.

The soil-productivity indexes given in Table 5 differ from those previously published by the University of Illinois Department of Agronomy primarily because management levels have progressively improved. The basic- and high-management levels used in Table 5 are higher than those published in 1950 in Illinois Agricultural Experiment Station Publication AG1443, "Illinois Soil Type Descriptions." This is reflected by the higher range of soil-productivity indexes and base yields for 1969 compared with the period from 1950 to 1968, as shown below. The 1 to 10 soil-productivity indexes used from 1936 to 1949 were for only a low (untreated) level of management without any indication of response to improved management.

Relationships among soil-productivity indexes in Illinois

1936-1949	*1950-1968*[a]	*1969*[b]
..	....	151–160
..	....	141–150
..	....	131–140
..	121–130	121–130
..	111–120	111–120
..	101–110	101–110
1	91–100	91–100
2	81–90	81–90
3	71–80	71–80
4	61–70	61–70
5	51–60	51–60
6	41–50	41–50
7	31–40	31–40
8	21–30	21–30
9	11–20	....
10	1–10	....

[a] Based on the following yields per acre under low (untreated) management: corn, 58 bushels; soybeans, 24 bushels; wheat, 22 bushels; oats, 38 bushels.

[b] Based on the following yields per acre under basic (crop residues and limestone) management: corn, 90 bushels; soybeans, 30 bushels; wheat, 30 bushels; oats, 60 bushels.

Adaptation of Various Crops to Different Soils

The productivity indexes and especially the crop yields indicate the relative adaptation of various crops to different soils. For example, corn and soybeans are better adapted than wheat and oats to nearly level soils that had poor natural drainage and sometimes still contain excess moisture, especially during early spring. Close-growing forage crops like alfalfa are better adapted than grain crops to well-drained, rolling soils. Conifer trees are especially well adapted to most well-drained and sandy soils. Many deciduous trees such as upland oaks are well adapted to well-drained, strongly rolling soils. Yellow poplar and black walnut grow well on moist sites on otherwise well-drained, rolling soils. Water-loving deciduous trees such as cottonwood, sycamore, silver (soft) maple, ash, etc. grow very rapidly on poorly drained bottomland soils.

Adjustments for Soil Erosion and Slope

The crop yields and productivity indexes given in Table 5 are for soils with little or no erosion and for slopes of less than 4-percent gradient, except for soils where a footnote indicates a steeper slope.

Erosion is especially harmful where it exposes a subsoil that provides an unfavorable environment for plant roots. Unfavorable subsoils or other subsurface layers include those composed of hard rock, more than approximately 40 percent clay with little structural development, or a large proportion of gravel within the rooting zone of common crops. Subsoils containing a distinct fragipan or excess exchangeable sodium are also unfavorable for root plants.

The following table suggests adjustments that may be made to crop yields and productivity indexes in Table 5 for moderate to severe erosion and for slopes different from those listed for the various soils in Table 5. Reductions for moderate to severe erosion are greater for soils with unfavorable subsoils than for those with favorable subsoils. Adjustments for erosion and various slopes are smaller under a high level of management than under the basic level of management.

	Slope gradient (percent)			
	0–4	*4–12*	*12–30*	*30+*
High level of management				
None to slight erosion	100	95	85	75
Moderate to severe erosion				
Favorable subsoil	95	85	75	65
Unfavorable subsoil	85	75	65	55
Basic level of management				
None to slight erosion	100	90	80	70
Moderate to severe erosion				
Favorable subsoil	90	75	65	55
Unfavorable subsoil	75	60	50	40

For example, it is estimated that under a high level of management Saybrook silt loam (No. 145) on a 10-percent slope would yield 5 percent less than the yields given in Table 5 for Saybrook silt loam. (Estimate based upon 100 percent for 0- to 4-percent slopes and 95 percent for 4- to 12-percent slopes.) Similarly, under a high level of management on Ava silt loam (No. 14), with an unfavorable fragipan in the lower subsoil, an area with a 16-percent slope and moderate to severe erosion would be expected to yield 30 percent less than the yields given in Table 5 for Ava silt loam. (Estimate based upon 95 percent for 4- to 12-percent slopes and 65 percent for moderate to severe erosion on 12- to 30-percent slopes.)

These slope adjustments can also be used to increase yields of soils that occur on gentler slopes than those for which crop yields are given in Table 5. For example, under a high level of management, Ava silt loam on 2-percent slopes would be expected to yield 5 percent more (100 percent versus 95 percent) than the yields given in Table 5 for Ava silt loam on 4- to 12-percent slopes.

Table 5. — Productivity of Soils in Illinois for Grain, Forage, and Tree Crops

Soil type No.	Soil type Name	Estimated crop yields per acre — Basic level of management: Corn	Soybeans	Wheat	Oats	Alfalfa	Mixed pasture[b]	High level of management: Corn	Soybeans	Wheat	Oats	Alfalfa	Mixed pasture[b]	Productivity indexes — Grain crops: Basic mgt.	High mgt.	Difference	Forage: Basic mgt.	High mgt.	Annual timber growth per acre[a]: Deciduous	Conifer
		bu.	bu.	bu.	bu.	tons	days	bu.	bu.	bu.	bu.	tons	days						bd. ft.	cords
2	Cisne silt loam	55	18	20	c	2.1	105	100	32	45	c	4.1	205	60	115	55	55	110	200	1.0
3	Hoyleton silt loam	55	17	20	c	2.2	110	101	31	46	c	4.3	215	60	115	55	60	115	250	1.3
4	Richview silt loam[de]	50	16	18	c	2.0	100	88	29	40	c	3.9	195	55	105	50	55	105	300	1.6
5	Blair silt loam[d]	35	13	15	c	1.6	80	65	23	34	c	3.0	150	45	80	35	45	85	175	1.0
6	Fishhook silt loam[fe]	g	g	8	16	1.0	50	g	g	19	29	2.1	105	30	55	25	30	60	125	.8
7	Atlas silt loam[fe]	g	g	7	13	.8	40	g	g	17	27	1.9	95	25	50	25	25	55	100	.6
8	Hickory loam[f]	g	g	10	18	1.2	60	g	g	21	31	2.2	110	30	60	30	35	65	225	1.2
12	Wynoose silt loam	44	16	16	c	1.8	90	83	30	38	c	3.5	175	50	100	50	50	95	175	.9
13	Bluford silt loam	50	16	18	c	2.0	100	90	30	43	c	3.7	185	55	110	55	55	105	225	1.2
14	Ava silt loam[de]	40	14	17	c	1.8	90	77	28	38	c	3.6	180	50	95	45	50	100	275	1.5
15	Parke silt loam[d]	50	15	18	c	1.9	95	89	29	42	c	3.7	185	55	105	50	55	105	300	1.5
16	Rushville silt loam	56	18	20	35	2.0	100	99	33	41	58	3.8	190	60	110	50	55	105	250	1.1
17	Keomah silt loam	71	22	24	48	2.7	135	112	35	45	65	4.6	230	75	125	50	75	125	300	1.4
18	Clinton silt loam[d]	63	19	21	42	2.6	130	104	34	44	62	4.4	220	70	115	45	70	120	350	1.7
19	Sylvan silt loam[d]	50	15	17	31	2.0	100	88	24	36	50	3.7	185	55	95	40	55	105	325	1.6
21	Pecatonica silt loam[d]	59	18	20	38	2.4	120	94	29	40	54	3.9	195	65	105	40	70	115	350	1.7
22	Westville silt loam[d]	51	16	17	31	2.0	100	86	28	37	54	3.8	190	55	95	40	60	110	325	1.5
23	Blount silt loam	52	18	19	33	2.1	105	92	32	42	58	3.9	195	60	105	45	60	110	225	1.2
24	Dodge silt loam[d]	60	20	22	39	2.5	125	100	34	43	58	4.2	210	65	115	50	70	120	350	1.7
25	Hennepin loam[f]	g	g	11	22	1.4	70	g	g	22	36	2.4	120	35	65	30	40	70	175	.9
26	Wagner silt loam	52	18	17	29	1.8	90	92	32	43	59	3.5	175	60	105	45	50	100	200	1.1
27	Miami silt loam[d]	56	18	19	35	2.3	115	96	33	40	56	4.0	200	60	110	50	65	115	300	1.4
28	Jules silt loam	62	19	20	37	2.6	130	109	36	45	65	4.6	230	65	120	55	70	120	350-500[h]	g
29	Dubuque silt loam[d]	34	13	15	26	1.6	80	65	21	29	44	2.8	140	40	75	35	45	85	250	1.1
30	Hamburg silt[f]	g	g	11	23	1.4	70	g	g	23	39	2.6	130	35	70	35	40	75	125	.5
31	Levan loamy fine sand	41	14	15	25	1.5	75	71	25	31	44	2.8	140	45	80	35	45	80	125	1.3
34	Tallula silt loam[d]	65	19	21	38	2.5	125	105	34	45	65	4.4	220	70	120	50	70	125	250	1.1
35	Bold silt loam[d]	37	12	15	27	1.7	85	58	20	28	41	2.9	145	40	70	30	50	85	175	.7
36	Tama silt loam	87	29	31	60	3.6	180	135	42	54	81	5.4	270	95	150	55	100	155		
37	Worthen silt loam	86	29	31	59	3.5	175	126	39	51	75	5.3	265	95	140	45	100	145		
39	Oakford silt loam	87	30	32	59	3.5	175	128	39	50	76	5.2	260	100	140	40	100	145		
40	Dodgeville silt loam[d]	51	18	20	35	2.1	105	76	30	37	55	3.4	170	60	95	35	65	105	275	1.2
41	Muscatine silt loam	91	31	32	62	3.7	185	145	46	56	86	5.6	280	100	160	60	100	160		
42	Papineau fine sandy loam	49	16	16	28	1.9	95	85	28	35	52	3.4	170	55	95	40	55	95	200	1.3
43	Ipava silt loam	90	31	32	61	3.6	180	142	47	57	83	5.5	275	100	160	60	100	155		
44	Hartsburg silt loam	86	27	27	55	3.1	155	131	43	51	75	4.9	245	95	145	50	90	140		
45	Denny silt loam	61	21	20	35	2.1	105	98	34	40	56	3.6	180	70	110	40	60	100	225	1.0
46	Herrick silt loam	77	27	29	58	3.1	155	123	41	53	71	5.0	250	90	140	50	90	140		
47	Virden silt loam	80	28	26	57	3.0	150	125	42	52	68	4.8	240	90	140	50	85	135		
48	Ebbert silt loam	72	25	25	c	2.7	135	113	38	47	c	4.5	225	80	130	50	75	120	225	1.0
49	Watseka loamy fine sand	51	16	17	31	1.9	95	80	28	37	56	3.4	170	55	95	40	55	95	125	1.2
50	Virden silty clay loam	79	27	26	55	2.9	145	124	42	51	66	4.7	235	90	140	50	85	135		
53	Bloomfield fine sand[d]	39	11	12	23	1.4	70	63	25	32	42	2.6	130	40	75	35	40	80	100	1.2
54	Plainfield sand[d]	30	9	10	20	1.2	60	46	16	22	33	2.0	100	35	55	20	35	60	75	1.0
55	Sidell silt loam[d]	70	21	23	47	2.8	140	112	38	48	68	4.5	225	75	125	50	80	130	400	1.9
56	Dana silt loam	80	25	27	58	3.1	155	124	41	52	77	5.0	250	90	140	50	90	145		
57	Montmorenci silt loam	68	22	23	43	2.8	140	110	38	47	70	4.6	230	75	125	50	80	130	350	1.6
59	Lisbon silt loam	89	30	31	60	3.5	175	135	46	55	84	5.4	270	100	155	55	100	155		
60	LaRose silt loam[d]	64	19	20	41	2.6	130	97	34	41	61	4.0	200	70	110	40	75	115	325	1.5
61	Atterberry silt loam	82	27	28	57	3.2	160	130	40	52	77	5.1	255	90	140	50	90	145		
62	Herbert silt loam	76	25	26	54	3.0	150	122	40	49	74	4.9	245	85	135	50	85	140		
67	Harpster silty clay loam	77	24	23	52	2.7	135	118	40	45	67	4.5	225	85	130	45	75	125		
68	Sable silty clay loam	90	32	30	58	3.4	170	136	46	53	77	5.1	255	100	150	50	95	145		
69	Milford silty clay loam	79	26	24	48	2.8	140	114	44	49	74	4.7	235	85	135	50	80	130		
70	Beaucoup silty clay loam	81	26	24	50	2.9	145	116	40	46	66	4.5	225	90	130	40	85	125		
71	Darwin silty clay	55	20	17	30	1.8	90	89	31	36	49	3.2	160	60	100	40	50	90	350-500[h]	g
72	Sharon silt loam	61	21	20	36	2.5	125	106	35	47	63	4.4	220	70	120	50	70	120	450-600[h]	g
73	Ross loam	80	27	27	57	3.1	155	123	41	50	71	4.9	245	90	140	50	90	135		
74	Radford silt loam	82	28	27	57	3.2	160	120	41	52	75	5.0	250	90	135	45	90	135		
75	Drury silt loam[d]	70	22	23	42	2.8	140	100	33	45	64	4.2	210	75	115	40	80	120	350	1.6
76	Otter silt loam	77	27	27	56	3.0	150	120	40	42	60	4.2	210	90	130	40	85	120		
77	Huntsville silt loam	84	29	31	59	3.6	180	128	43	53	75	5.2	260	95	145	50	95	145		
78	Arenzville silt loam	74	24	25	54	3.0	150	116	36	47	69	4.8	240	80	125	45	85	130	525-675[h]	g
79	Volinia silt loam	65	20	22	38	2.4	120	93	33	44	61	4.1	205	70	110	40	70	115	275	1.7
81	Littleton silt loam	90	31	32	60	3.6	180	133	42	54	79	5.4	270	100	145	45	100	145		
82	Millington loam	73	23	20	42	2.5	125	113	36	44	61	4.2	210	80	125	45	75	120	425-575[h]	g
83	Wabash silty clay	62	21	18	32	2.0	100	92	33	37	51	3.4	170	65	105	40	55	95	375-525[h]	g
84	Okaw silt loam	41	15	14	22	1.4	70	73	25	36	49	2.8	140	45	85	40	40	80	175	.9
85	Jacob clay	30	11	10	20	.9	45	55	23	24	33	2.0	100	35	65	30	25	55	300-450[h]	g
87	Dickinson sandy loam	55	17	19	37	2.1	105	84	30	38	57	3.5	175	60	100	40	60	105	150	1.5
88	Sparta loamy sand	46	15	16	28	1.7	85	74	26	32	48	3.0	150	50	85	35	50	90	100	1.3
89	Maumee fine sandy loam	54	17	18	30	1.9	95	90	31	36	53	3.4	170	60	100	40	55	95	150	1.1

[a] Soils with a productivity index of 85 or higher for grain crops under the basic level of management were not given a timber index. Native deciduous trees usually grow well on these soils, but they are rarely used for this purpose except in undrained bottomlands where water-loving trees grow rapidly.

[b] Expected number of days that one acre will carry one cow.

[c] Oat yields are not given for soils restricted to areas in southern Illinois where the oat acreage is very small. These soils are in areas E, F, O, P, Q, and R in Illinois Agricultural Experiment Station Bulletin 725.

[d] Estimated yields and productivity for slopes with gradients of 4 to 12 percent. See page 12 for adjustments for other slopes and erosion.

[e] Erosion-susceptible soils with unfavorable subsoils.

[f] Estimated yields and productivity for slopes with gradients of 12 to 30 percent. See page 12 for adjustments for other slopes and erosion.

[g] Crop not adapted.

[h] Most of the bottomland soils are well adapted to water-loving trees such as cottonwood, sycamore, sweet gum, silver (soft) maple, swamp white oak, pin oak, cherrybark oak, ash, and bur oak. The annual growth of these deciduous trees is expressed as a range, with cottonwood and sycamore growing more rapidly and other trees at slower rates. Conifer trees are not adapted to most of these bottomland soils.

Table 5. — continued

Soil type No.	Soil type Name	Basic mgt. Corn (bu.)	Basic mgt. Soybeans (bu.)	Basic mgt. Wheat (bu.)	Basic mgt. Oats (bu.)	Basic mgt. Alfalfa (tons)	Basic mgt. Mixed pasture[b] (days)	High mgt. Corn (bu.)	High mgt. Soybeans (bu.)	High mgt. Wheat (bu.)	High mgt. Oats (bu.)	High mgt. Alfalfa (tons)	High mgt. Mixed pasture[b] (days)	Grain crops Basic mgt.	Grain crops High mgt.	Grain crops Difference	Forage Basic mgt.	Forage High mgt.	Timber Deciduous (bd. ft.)	Timber Conifer (cords)
90	Plainfield fine sand[d]	35	10	11	21	1.2	60	50	18	25	37	2.2	110	35	60	25	35	65	90	1.1
91	Swygert silty clay loam[e]	58	20	21	38	2.3	115	99	35	44	66	4.1	205	65	115	50	65	115	250	1.3
92	Sarpy sand	38	11	12	23	1.4	70	60	23	29	42	2.6	130	40	70	30	40	75	225-375[h]	g
93	Rodman gravelly loam[de]	g	g	9	16	1.0	50	g	g	19	30	2.1	105	30	55	25	30	60	50	.5
97	Houghton peat	70	21	g	g	g	115	104	34	g	g	g	175	75	115	40	65	100	g	g
98	Ade loamy fine sand	51	16	18	33	1.9	95	79	28	36	52	3.4	170	55	90	35	55	95	125	1.4
100	Palms muck	68	20	g	g	g	105	100	33	g	g	g	165	70	110	40	60	95	g	g
101	Milroy fine sandy loam	55	17	17	32	1.8	90	80	29	36	52	3.2	160	60	95	35	50	90	200	1.0
102	LaHogue loam	74	24	27	53	3.0	150	112	39	49	73	4.7	235	85	130	45	85	130		
103	Houghton muck	75	25	g	g	g	140	112	40	g	g	g	200	85	130	45	75	115	g	g
104	Virgil silt loam	83	27	27	58	3.2	160	129	41	52	76	5.1	255	90	145	55	90	145		
105	Batavia silt loam	77	25	25	56	3.1	155	120	39	48	74	4.9	245	85	135	50	90	140		
107	Sawmill silty clay loam	85	30	29	55	3.4	170	125	41	46	67	4.9	245	95	140	45	90	135		
108	Bonnie silt loam	50	18	17	26	1.8	90	94	32	38	53	3.5	175	55	105	50	50	95	400-550[h]	g
109	Racoon silt loam	53	19	19	c	2.0	100	94	32	42	c	3.7	185	60	110	50	55	105	200	1.1
110	Venedy silt loam	64	22	21	40	2.4	120	106	37	47	66	4.2	210	70	120	50	70	120	275	1.4
112	Cowden silt loam	63	21	23	c	2.4	120	109	35	47	c	4.4	220	70	125	55	65	120	225	1.1
113	Oconee silt loam	60	20	22	c	2.6	130	108	34	47	c	4.6	230	70	125	55	70	125	300	1.4
114	O'Fallon silt loam[d]	55	18	20	c	2.3	115	94	31	43	c	4.3	215	60	110	50	65	115	350	1.7
116	Whitson silt loam	63	21	20	42	2.3	115	106	33	39	59	3.9	195	70	115	45	65	110	250	1.1
119	Elco silt loam[d]	55	18	20	36	2.2	110	84	27	35	51	3.5	175	60	95	35	65	100	250	1.4
120	Huey silt loam	36	12	13	c	1.4	70	56	21	29	c	2.4	120	40	70	30	45	75	100	.5
122	Colp silt loam[de]	40	12	13	22	1.5	75	68	26	34	47	3.0	150	40	80	40	45	85	225	1.4
124	Beaucoup gravelly clay loam	71	24	23	49	2.7	135	113	39	43	62	4.2	210	80	125	45	75	120	450-600[h]	g
125	Selma loam	76	26	28	56	2.8	140	118	40	46	69	4.5	225	85	130	45	80	125		
127	Harrison silt loam	70	24	25	50	2.9	145	118	38	51	69	4.8	240	80	130	50	85	135	400	1.9
128	Douglas silt loam[d]	63	20	22	42	2.6	130	108	35	47	64	4.5	225	70	120	50	75	125	400	1.9
130	Pittwood fine sandy loam	68	23	21	47	2.5	125	104	37	43	66	4.1	205	75	120	45	70	115	275	1.3
131	Alvin fine sandy loam[d]	54	17	18	31	2.1	105	79	29	37	52	3.4	170	60	95	35	60	100	175	1.5
132	Starks silt loam	69	22	22	48	2.8	140	112	36	48	65	4.6	230	75	125	50	75	125	300	1.4
134	Camden silt loam	64	20	21	43	2.7	135	106	35	45	64	4.5	225	70	120	50	75	125	325	1.7
136	Brooklyn silt loam	56	18	19	35	1.8	90	94	32	38	53	3.4	170	60	105	45	50	95	200	.9
137	Ellison silt loam	54	17	18	31	2.1	105	85	29	38	53	3.6	180	60	95	35	60	100	225	1.5
138	Shiloh silty clay loam	76	27	26	47	2.8	140	117	40	47	62	4.4	220	85	130	45	80	125		
141	Wesley sandy loam	59	19	19	38	2.2	110	97	33	42	67	4.0	200	65	110	45	65	115	250	1.4
142	Patton silty clay loam	75	27	26	51	2.8	140	120	41	47	65	4.6	230	85	135	50	80	130		
144	Alvin sandy loam[d]	52	16	17	29	1.9	95	75	27	35	50	3.2	160	55	90	35	55	95	150	1.4
145	Saybrook silt loam	81	25	26	55	3.1	155	121	42	52	76	5.1	255	90	140	50	90	145		
146	Elliott silt loam	68	23	24	46	2.8	140	110	38	47	72	4.6	230	75	125	50	80	130	275	1.4
147	Clarence silt loam[e]	48	17	18	29	1.9	95	87	32	41	60	3.7	185	55	105	50	55	105	225	1.2
148	Proctor silt loam	81	27	29	59	3.1	155	125	40	51	80	5.0	250	90	140	50	90	145		
149	Brenton silt loam	88	31	31	60	3.5	175	139	43	54	83	5.4	270	100	150	50	100	155		
150	Onarga sandy loam	60	18	20	40	2.3	115	90	32	40	59	3.7	185	65	105	40	65	105	200	1.6
151	Ridgeville fine sandy loam	66	22	22	47	2.8	140	100	36	46	68	4.2	210	75	115	40	80	120	250	1.6
152	Drummer silty clay loam	89	32	30	57	3.4	170	134	46	53	75	5.0	250	100	150	50	95	145		
153	Pella silty clay loam	79	28	26	53	2.9	145	122	44	49	71	4.7	235	90	140	50	85	135		
154	Flanagan silt loam	90	31	32	60	3.6	180	141	47	58	84	5.5	275	100	160	60	100	155		
155	Stockland loam[de]	43	14	15	27	1.6	80	65	23	34	50	3.1	155	45	80	35	50	90	225	1.4
156	Ridgeville sandy loam	65	21	21	45	2.6	130	98	35	44	66	4.1	205	70	115	45	75	115	225	1.5
157	Rankin sandy loam	53	17	17	31	2.1	105	90	30	38	58	3.6	180	60	100	40	60	105	225	1.5
159	Pillot silt loam	64	20	22	40	2.5	125	92	30	41	59	3.8	190	70	105	35	70	110	325	1.6
161	Newart silt loam	75	26	28	54	3.0	150	120	40	50	72	4.7	235	85	135	50	85	135		
162	Gorham silty clay loam	73	26	26	49	2.8	140	118	40	47	68	4.5	225	85	135	50	80	130		
164	Stoy silt loam	60	18	20	c	2.3	115	97	32	45	c	4.1	205	65	115	50	65	115	275	1.3
165	Weir silt loam	50	17	18	c	1.9	95	90	31	39	c	3.5	175	55	105	50	55	100	200	1.0
167	Lukin silt loam	58	19	21	c	2.3	115	105	33	47	c	4.4	220	65	120	55	65	120	275	1.4
171	Catlin silt loam	85	27	29	59	3.4	170	128	41	53	79	5.3	265	95	145	50	95	150		
172	Hoopeston sandy loam	62	19	21	40	2.3	115	91	30	41	64	3.7	185	65	105	40	65	105	175	1.3
173	McGary silt loam[e]	45	15	16	27	1.8	90	79	31	42	59	3.3	165	50	95	45	50	100	175	1.1
175	Lamont fine sandy loam[d]	45	14	16	28	1.7	85	68	27	34	48	3.1	155	50	85	35	50	90	125	1.3
176	Marissa silt loam	76	26	28	52	3.0	150	119	40	50	70	4.8	240	85	135	50	85	135		
178	Ruark fine sandy loam	53	16	15	30	1.7	85	78	29	34	48	3.0	150	55	90	35	50	85	225	1.1
180	Dupo silt loam	72	23	24	50	2.9	145	112	37	46	67	4.6	230	80	125	45	80	125	475-625[h]	g
184	Roby fine sandy loam	57	19	20	35	2.3	115	85	30	39	57	3.7	185	65	100	35	65	105	200	1.4
185	Roby sandy loam	55	18	19	33	2.2	110	82	28	37	55	3.6	180	60	95	35	65	105	175	1.3
187	Milroy sandy loam	54	16	16	32	1.8	90	79	29	35	50	3.1	155	55	90	35	50	90	200	1.0
188	Beardstown loam	65	23	23	49	2.7	135	101	34	45	60	4.1	205	75	115	40	75	115	300	1.4
189	Martinton silt loam	76	26	26	54	3.0	150	117	41	50	76	4.8	240	85	135	50	85	135		
190	Onarga fine sandy loam	64	20	22	43	2.4	120	94	34	42	61	3.8	190	70	110	40	70	110	225	1.7
191	Knight silt loam	65	22	21	45	2.4	120	103	38	43	62	4.0	200	75	120	45	70	115	225	1.0
192	Del Rey silt loam	63	20	21	40	2.4	120	100	34	43	63	4.1	205	70	115	45	70	115	250	1.3
194	Morley silt loam[d]	44	15	15	26	1.7	85	82	29	37	53	3.5	175	50	95	45	50	100	275	1.3
197	Troxel silt loam	86	29	29	58	3.3	165	129	41	48	72	4.9k	245	95	140	45	95	140		
198	Elburn silt loam	90	31	31	61	3.6	180	140	45	55	85	5.5	275	100	155	55	100	155		
199	Plano silt loam	86	29	31	60	3.5	175	131	41	52	82	5.3	265	95	145	50	100	150		
200	Orio sandy loam	68	21	21	42	2.4	120	97	34	41	58	3.7	185	75	110	35	70	105	250	1.2
201	Gilford fine sandy loam	65	21	21	43	2.3	115	96	35	40	62	3.7	185	70	110	40	65	105	200	1.2
202	Biggs sandy loam	45	15	16	25	1.6	80	75	26	32	46	2.8	140	50	85	35	45	80	150	1.1

Note: In the printed header, "Annual timber growth per acre" carries footnote mark [a].

(Footnotes on page 13.)

Table 5. — continued

Soil type No.	Soil type Name	Basic level: Corn	Basic: Soybeans	Basic: Wheat	Basic: Oats	Basic: Alfalfa	Basic: Mixed pasture[b]	High level: Corn	High: Soybeans	High: Wheat	High: Oats	High: Alfalfa	High: Mixed pasture[b]	Grain crops: Basic mgt.	Grain crops: High mgt.	Grain crops: Difference	Forage: Basic mgt.	Forage: High mgt.	Annual timber growth per acre[a]: Deciduous	Conifer
		bu.	bu.	bu.	bu.	tons	days	bu.	bu.	bu.	bu.	tons	days						bd. ft.	cords
203	Kilbourne loamy sand	30	11	11	20	1.1	55	55	21	26	38	2.1	105	35	65	30	30	60	100	1.0
204	Ayr sandy loam	66	22	23	48	2.6	130	103	35	45	64	4.1	205	75	115	40	75	115	250	1.7
205	Metea sandy loam	55	17	18	32	2.1	105	90	32	40	57	3.6	180	60	105	45	60	105	225	1.6
206	Thorp silt loam	66	23	22	48	2.5	125	110	38	44	63	4.2	210	75	125	50	70	120	275	1.3
207	Ward silt loam	62	21	20	40	2.3	115	105	35	43	60	4.0	200	70	120	50	65	115	275	1.2
208	Sexton silt loam	62	21	20	40	2.2	110	104	34	42	59	3.9	195	70	115	45	65	110	250	1.1
210	Lena muck	72	23	g	g	g	125	109	37	g	g	g	180	80	120	40	70	105	g	g
211	Tamms silt loam	52	16	18	31	2.0	100	91	29	41	58	3.7	185	55	100	45	55	105	275	1.3
212	Thebes silt loam	49	15	16	29	1.9	95	87	28	40	56	3.6	180	55	100	45	55	105	300	1.5
214	Hosmer silt loam[d]	49	16	18	c	2.1	105	86	29	41	c	3.9	195	55	105	50	60	110	325	1.6
215	Wartrace silt loam[d]	55	18	20	c	2.3	115	95	31	43	c	4.1	205	60	110	50	65	115	350	1.7
216	Stookey silt loam[f]	g	g	13	24	1.5	75	g	g	24	38	2.8	140	40	75	35	45	80	375	1.7
218	Newberry silt loam	59	20	21	c	2.2	110	103	34	46	c	4.1	205	65	120	55	60	110	175	.9
219	Millbrook silt loam	78	26	28	52	3.0	150	125	39	51	74	4.9	245	85	140	55	85	140		
220	Plattville silt loam	65	23	24	49	2.7	135	102	38	46	68	4.2	210	75	120	45	75	120	300	1.4
221	Parr silt loam[d]	72	20	21	47	2.7	135	102	36	46	66	4.4	220	75	120	45	80	125	350	1.6
223	Varna silt loam[d]	58	18	19	38	2.2	110	97	34	42	62	4.0	200	65	110	45	65	115	300	1.5
224	Strawn silt loam[d]	48	15	16	29	1.8	90	86	26	34	49	3.3	165	50	95	45	50	95	250	1.2
225	Beaver silt loam	72	21	22	48	2.7	135	112	37	46	72	4.4	220	75	125	50	75	125	325	1.6
227	Argyle silt loam[d]	63	19	21	42	2.5	125	98	32	43	59	4.0	200	70	110	40	70	115	375	1.8
228	Nappanee silt loam[e]	40	13	14	26	1.6	80	76	28	35	50	3.1	155	45	90	45	45	90	175	1.0
229	Monee silt loam	44	15	14	25	1.5	75	76	29	36	50	3.0	150	50	90	40	45	85	125	.6
230	Rowe silty clay	56	19	18	31	2.0	100	94	36	39	57	3.6	180	60	110	50	55	100	200	1.0
232	Ashkum silty clay loam	76	26	24	46	2.8	140	113	43	47	72	4.5	225	85	135	50	80	125		
233	Birkbeck silt loam	66	21	23	46	2.7	135	107	37	48	64	4.5	225	75	125	50	75	125	375	1.8
234	Sunbury silt loam	83	27	28	56	3.2	160	128	41	54	76	5.1	255	90	140	50	90	140		
235	Bryce silty clay	66	23	21	39	2.4	120	104	39	42	64	4.0	200	75	120	45	70	115	225	1.1
236	Sabina silt loam	73	23	25	50	2.9	145	116	38	49	68	4.7	235	80	130	50	80	130	325	1.5
237	Hoopeston loam	64	20	22	45	2.5	125	94	32	42	66	3.9	195	70	110	40	70	110	200	1.4
238	Rantoul silty clay	53	18	14	25	1.6	80	93	32	31	45	2.9	145	55	100	45	45	85	150	g
239	Dorchester silt loam	70	20	20	45	2.7	135	112	37	45	66	4.7	235	75	125	50	75	125	450-600[h]	g
241	Chatsworth silt loam[fe]	g	g	7	13	.8	40	g	g	15	26	1.7	85	25	45	20	25	50	75	.5
242	Kendall silt loam	73	23	24	51	2.9	145	117	37	48	68	4.7	235	80	130	50	80	130	325	1.5
243	St. Charles silt loam	67	21	23	47	2.7	135	110	35	46	66	4.5	225	75	120	45	75	125	375	1.8
244	Hartsburg silty clay loam	84	28	26	53	3.0	150	126	43	49	72	4.8	240	90	140	50	85	135		
246	Bolivia silt loam	86	28	31	60	3.5	175	137	43	55	82	5.4	270	95	150	55	100	155		
248	McFain silty clay	64	22	20	35	2.3	115	105	35	41	60	4.0	200	70	115	45	65	105	400-500[h]	g
249	Edinburg silty clay loam	75	25	24	47	2.6	130	115	39	48	65	4.2	210	85	130	45	80	120		
250	Velma loam[d]	54	17	19	30	2.1	105	95	32	41	59	3.9	195	60	110	50	60	110	275	1.5
252	Harvel silty clay loam	79	27	26	49	2.8	140	120	41	45	64	4.6	230	90	135	45	85	125		
253	Stonington loam[de]	39	12	14	26	1.5	75	60	21	29	45	2.8	140	40	70	30	45	80	200	1.2
256	Pana silt loam[d]	50	16	18	28	2.0	100	86	28	39	56	3.6	180	55	100	45	60	110	275	1.5
257	Clarksdale silt loam	82	27	27	55	3.2	160	122	39	50	72	4.8	240	90	135	45	90	135		
258	Sicily silt loam	72	23	25	50	3.0	150	112	37	49	69	4.6	230	80	125	45	85	130	375	1.8
259	Assumption silt loam[d]	62	18	20	38	2.4	120	103	33	44	64	4.2	210	65	115	50	70	120	300	1.6
261	Niota silt loam	44	15	15	27	1.7	85	75	27	34	48	3.0	150	55	90	35	50	85	175	1.0
262	Denrock silt loam	57	18	18	35	2.1	105	94	34	40	57	3.7	185	60	110	50	60	105	225	1.3
263	Fall silt loam	78	24	26	54	3.0	150	116	38	50	74	4.8	240	85	130	45	85	135		
264	El Dara sandy loam[f]	g	g	8	16	1.0	50	g	g	17	28	2.0	100	25	50	25	30	60	125	1.1
265	Lomax loam	65	20	22	42	2.5	125	96	33	39	60	4.0	200	70	110	40	70	115	250	1.7
266	Disco sandy loam	56	18	20	34	2.1	105	85	30	37	58	3.5	175	60	100	40	60	105	175	1.5
268	Mt. Carroll silt loam[d]	70	22	24	45	2.8	140	109	35	46	70	4.6	230	75	120	45	80	125	400	1.8
270	Oquawka sand	42	13	14	27	1.6	80	70	20	28	42	2.8	140	45	75	30	45	80	90	1.2
271	Timula silt loam[d]	51	15	17	32	2.0	100	83	27	34	50	3.5	175	55	95	40	55	100	225	1.0
272	Edgington silt loam	69	23	22	42	2.5	125	106	38	44	62	4.1	205	75	120	45	70	115	250	1.1
273	Decorra silt loam	65	20	22	47	2.8	140	106	35	45	66	4.6	230	70	120	50	75	125	375	1.7
274	Seaton silt loam[d]	56	18	20	37	2.4	120	96	30	41	61	4.3	215	60	105	45	65	115	375	1.7
275	Joy silt loam	90	30	32	61	3.7	185	140	44	55	84	5.5	275	100	155	55	100	155		
276	Biggsville silt loam	84	28	29	58	3.4	170	127	41	52	80	5.1	255	95	140	45	95	145		
277	Port Byron silt loam[d]	77	25	27	56	3.2	160	116	39	49	75	4.9	245	85	130	45	90	140		
278	Stronghurst silt loam	74	23	25	51	2.9	145	120	38	48	69	4.8	240	80	130	50	80	130	350	1.5
279	Rozetta silt loam	71	21	23	46	2.7	135	114	36	47	66	4.6	230	75	125	50	75	125	400	1.8
280	Fayette silt loam[d]	65	20	22	43	2.6	130	106	33	45	63	4.4	220	70	115	45	70	120	400	1.8
281	Hopper silt loam[f]	g	g	14	25	1.7	85	g	g	25	40	2.9	145	45	75	30	50	85	275	1.3
282	Chute fine sand[f]	g	g	11	20	1.3	65	g	g	20	32	2.2	110	35	60	25	40	70	85	.7
283	Clary silt loam[d]	56	19	20	37	2.3	115	94	31	43	60	4.2	210	65	105	40	65	115	375	1.7
284	Tice silty clay loam	83	29	30	57	3.5	175	128	41	52	74	5.1	255	95	140	45	95	140		
285	Carmi loam	72	20	24	48	2.7	135	95	32	48	66	4.1	205	75	110	35	75	115	275	1.7
286	Carmi sandy loam	67	18	22	41	2.5	125	90	30	46	63	3.9	195	70	105	35	70	110	250	1.6
287	Chauncey silt loam	60	20	22	c	2.2	110	104	34	46	c	4.3	215	70	120	50	60	115	225	1.1
288	Petrolia silty clay loam	67	21	20	43	2.3	115	106	37	41	58	4.0	200	70	120	50	65	110	375-525[h]	g
289	Omaha loam	75	22	25	53	2.8	140	100	37	49	68	4.2	210	80	120	40	80	120	275	1.5
290	Warsaw silt loam	75	21	24	53	2.8	140	100	36	46	67	4.2	210	80	115	35	80	120	325	1.5
291	Xenia silt loam	66	20	22	44	2.5	125	110	37	48	65	4.4	220	70	125	55	70	125	350	1.7
292	Wallkill silt loam	71	21	20	45	2.4	120	110	38	36	59	3.9	195	75	120	45	70	110	375-525[h]	g
293	Andres silt loam	83	28	28	55	3.3	165	126	44	53	80	5.0	250	95	145	50	95	145		

(Footnotes on page 13.)

Table 5. — continued

Soil type		Estimated crop yields per acre												Productivity indexes					Annual timber growth per acre[a]	
No.	Name	Basic level of management						High level of management						Grain crops			Forage		Deciduous	Conifer
		Corn	Soybeans	Wheat	Oats	Alfalfa	Mixed[b] pasture	Corn	Soybeans	Wheat	Oats	Alfalfa	Mixed[b] pasture	Basic mgt.	High mgt.	Difference	Basic mgt.	High mgt.		
		bu.	bu.	bu.	bu.	tons	days	bu.	bu.	bu.	bu.	tons	days						bd. ft.	cords
294	Symerton silt loam	80	25	26	54	3.0	150	118	40	51	75	4.9	245	85	135	50	85	140		
295	Mokena silt loam	68	22	22	46	2.6	130	110	37	48	70	4.3	215	75	125	50	75	125	275	1.4
296	Washtenaw silt loam	72	23	22	47	2.6	130	114	39	37	60	4.0	200	80	125	45	75	115	425-575[h]	g
297	Ringwood silt loam	75	23	25	56	3.0	150	111	40	51	73	4.7	235	80	130	50	85	135	375	1.8
298	Beecher silt loam	60	20	21	40	2.4	120	101	35	44	65	4.1	205	65	115	50	70	115	250	1.3
299	Nippersink silt loam	67	21	23	46	2.6	130	106	37	48	70	4.4	220	75	125	50	75	125	350	1.7
300	Abington clay loam	79	25	27	55	2.8	140	110	43	47	68	4.4	220	85	130	45	80	125		
301	Grantsburg silt loam[de]	38	13	15	c	1.6	80	70	26	37	c	3.4	170	45	90	45	45	95	250	1.4
302	Ambraw clay loam	70	22	21	47	2.5	125	110	36	42	61	4.1	205	75	120	45	70	115	425-575[h]	g
304	Landes fine sandy loam	50	17	18	30	1.9	95	82	29	36	53	3.3	165	55	95	40	55	95	375-525[h]	g
305	Palestine loam	65	19	20	38	2.4	120	90	29	38	55	3.8	190	70	100	30	70	110	250	1.6
306	Allison silty clay loam	82	28	29	58	3.4	170	126	42	51	71	5.1	255	95	140	45	95	140		
307	Iona silt loam	66	21	22	43	2.6	130	107	34	44	62	4.5	225	70	120	50	70	120	350	1.7
308	Alford silt loam[d]	63	20	22	c	2.5	125	102	32	44	c	4.4	220	70	115	45	70	120	400	2.0
309	Keytesville silt loam[e]	32	11	12	23	1.4	70	57	21	26	38	2.4	120	35	65	30	40	70	150	.7
310	McHenry silt loam	58	19	21	37	2.3	115	101	34	45	65	4.2	210	65	115	50	65	115	325	1.6
311	Ritchey silt loam[de]	31	13	14	25	1.4	70	54	22	31	44	2.5	125	40	70	30	40	75	200	.9
313	Rodman loam	30	10	12	22	1.2	60	50	17	25	37	2.3	115	35	60	25	35	65	100	.7
314	Joliet silty clay loam	41	16	15	27	1.6	80	72	29	34	49	3.0	150	50	90	40	45	85	200	.9
315	Channahon silt loam[e]	37	15	16	28	1.5	75	65	26	35	50	2.9	145	45	80	35	45	85	225	1.0
316	Romeo silt loam	g	g	g	g	g	55	g	g	g	g	g	85	g	g		30	50	200-300[h]	g
317	Millsdale silty clay loam	60	23	20	38	2.3	115	98	37	41	59	4.0	200	70	115	45	65	110	275	1.2
318	Lorenzo silt loam[e]	58	16	18	36	2.0	100	80	27	38	55	3.3	165	60	90	30	65	100	225	1.2
320	Frankfort silt loam[e]	46	16	17	28	1.7	85	83	30	39	54	3.4	170	50	95	45	50	95	200	1.1
321	DuPage silt loam	67	22	19	44	2.6	130	108	34	44	62	4.4	220	75	120	45	75	125	475-625[h]	g
322	Russell silt loam[d]	59	19	21	39	2.4	120	101	34	44	57	4.2	210	65	115	50	70	120	350	1.7
323	Casco silt loam[de]	46	14	16	26	1.6	80	70	23	32	45	2.9	145	50	80	30	55	90	175	1.0
324	Lena peat	66	19	g	g	g	105	91	29	g	g	g	155	70	100	30	60	90	g	g
325	Dresden silt loam	62	19	21	42	2.5	125	96	33	43	63	4.1	205	65	110	45	70	115	300	1.4
326	Homer silt loam	64	19	20	40	2.4	120	100	34	42	61	4.0	200	70	115	45	70	115	275	1.1
327	Fox silt loam	55	18	19	34	2.1	105	92	30	40	58	3.9	195	60	105	45	60	110	275	1.3
329	Will silty clay loam	77	23	25	52	2.8	140	102	39	46	66	4.3	215	85	120	35	80	120		
330	Peotone silty clay loam	70	24	22	45	2.5	125	107	38	37	53	3.8	190	80	120	40	70	110	200	g
331	Haymond silt loam	72	22	24	50	2.9	145	118	39	50	68	4.7	235	80	130	50	80	130	550-700[h]	g
332	Billett sandy loam	49	16	17	32	1.9	95	78	28	36	53	3.4	170	55	90	35	55	95	135	1.4
333	Wakeland silt loam	70	22	23	47	2.7	135	113	38	48	65	4.6	230	75	125	50	75	125	500-650[h]	g
334	Birds silt loam	65	20	21	40	2.2	110	102	36	43	62	3.9	195	70	115	45	60	105	450-600[h]	g
335	Robbs silt loam	47	15	17	c	1.8	90	80	28	41	c	3.6	180	50	100	50	50	100	200	1.1
337	Creal silt loam	53	18	19	c	2.1	105	95	32	44	c	3.9	195	60	115	55	60	110	250	1.3
338	Hurst silt loam[e]	45	16	16	25	1.7	85	76	29	39	56	3.3	165	50	90	40	50	95	200	1.2
339	Wellston silt loam[fe]	g	g	9	19	1.2	60	g	g	19	29	2.2	110	30	55	25	35	65	175	1.0
340	Zanesville silt loam[f]	g	g	13	23	1.4	70	g	g	27	37	2.8	140	40	75	35	40	80	225	1.2
341	Gilmer silt loam	74	24	26	52	2.8	140	108	37	46	73	4.6	230	80	125	45	80	130	325	1.6
342	Matherton silt loam	70	20	24	42	2.6	130	103	36	45	66	4.2	210	75	120	45	75	120	275	1.3
343	Kane silt loam	76	22	26	54	2.8	140	106	39	48	69	4.4	220	80	125	45	80	125	300	1.4
344	Harvard silt loam	72	23	25	48	2.9	145	115	37	47	71	4.7	235	80	130	50	85	135	350	1.8
346	Dowagiac silt loam	61	19	20	35	2.2	110	89	32	39	57	3.8	190	65	105	40	65	110	250	1.6
348	Wingate silt loam	70	23	25	47	2.8	140	116	38	49	72	4.6	230	80	130	50	80	130	375	1.8
353	Toronto silt loam	74	25	27	50	3.0	150	123	40	51	73	4.9	245	85	135	50	85	140		
359	Epworth fine sandy loam	65	20	22	43	2.4	120	87	31	36	52	3.5	175	70	100	30	70	100	200	1.6
361	Lapeer loam[d]	50	15	16	30	1.9	95	78	29	36	55	3.4	170	55	95	40	55	100	275	1.3
363	Griswold loam[d]	62	18	20	40	2.4	120	89	34	44	63	4.0	200	65	110	45	70	115	325	1.5
364	Pistakee silt loam	70	21	22	45	2.7	135	110	39	46	68	4.6	230	75	125	50	75	125	300	1.4
365	Aptakisic silt loam	66	21	21	45	2.6	130	100	35	44	64	4.4	220	70	115	45	70	115	275	1.3
370	Saylesville silt loam	57	21	22	40	2.3	115	93	32	40	60	3.9	195	65	105	40	65	110	300	1.5
375	Rutland silt loam	80	26	26	57	3.1	155	115	41	51	76	4.8	240	90	135	45	90	135		
382	Belknap silt loam	56	20	19	32	2.2	110	101	33	44	58	4.1	205	65	115	50	65	115	400-550[h]	g
386	Downs silt loam[d]	73	25	26	56	3.0	150	118	37	49	71	4.8	240	85	130	45	85	135		
388	Wenona silt loam	75	24	25	55	3.0	150	108	38	48	72	4.6	230	85	125	40	85	130		
390	Hesch fine sandy loam	53	15	17	35	1.9	95	84	30	37	53	3.3	165	55	95	40	55	95	125	1.3
397	Boone loamy fine sand[f]	g	g	8	17	1.1	55	g	g	18	29	2.1	105	30	55	25	30	60	100	1.1
400	Calco silty clay loam	71	23	22	45	2.5	125	112	38	43	63	4.2	210	80	125	45	70	120	375-525[h]	g
401	Okaw silty clay loam	33	14	13	20	1.4	70	60	23	32	44	2.6	130	40	75	35	40	75	150	.7
404	Titus silty clay	66	22	21	40	2.4	120	104	36	43	60	3.8	190	75	120	45	70	110	400-550[h]	g
410	Woodbine silt loam[d]	46	16	17	28	1.8	90	74	26	30	43	3.1	155	50	85	35	50	90	300	1.3
411	Ashdale silt loam[d]	65	20	21	47	2.6	130	92	33	42	61	4.1	205	70	110	40	70	115	375	1.6
412	Ogle silt loam[d]	70	20	23	47	2.7	135	103	34	44	64	4.2	210	75	115	40	75	120	415	2.0
413	Gale silt loam[d]	45	15	16	27	1.7	85	69	23	27	39	2.8	140	50	75	25	50	80	225	1.1
414	Myrtle silt loam[d]	66	20	20	45	2.5	125	99	34	42	61	4.0	200	70	115	45	70	115	395	1.9
415	Orion silt loam	69	23	22	45	2.6	130	113	37	43	63	4.2	210	75	125	50	75	120	425-575[h]	g
416	Durand silt loam[d]	73	23	25	53	2.8	140	103	36	45	64	4.3	215	80	120	40	80	125	400	1.9
417	Derinda silt loam[de]	38	12	14	24	1.4	70	66	24	29	43	2.7	135	40	75	35	40	75	175	.9
418	Schapville silt loam[de]	44	15	16	28	1.8	90	72	28	32	47	3.1	155	50	85	35	50	90	225	1.1
419	Flagg silt loam[d]	60	18	19	38	2.2	110	95	31	38	55	3.8	190	65	105	40	65	110	375	1.8
420	Piopolis silty clay loam	55	19	18	31	1.9	95	95	33	37	52	3.5	175	60	105	45	55	95	350-500[h]	g
422	Cape silty clay loam	48	17	16	26	1.6	80	90	30	35	47	3.0	150	55	100	45	50	90	325-475[h]	g
425	Muskingum stony silt loam[fe]	g	g	g	g	.7	35	g	g	g	g	1.4	70	g	g		20	40	125	.8

(Footnotes on page 13.)

Table 5. — continued

Soil type		Estimated crop yields per acre												Productivity indexes					Annual timber growth per acre[a]	
		Basic level of management						High level of management						Grain crops			Forage			
No.	Name	Corn	Soybeans	Wheat	Oats	Alfalfa	Mixed[b] pasture	Corn	Soybeans	Wheat	Oats	Alfalfa	Mixed[b] pasture	Basic mgt.	High mgt.	Difference	Basic mgt.	High mgt.	Deciduous	Conifer
		bu.	bu.	bu.	bu.	tons	days	bu.	bu.	bu.	bu.	tons	days						bd. ft.	cords
426	Karnak silty clay	47	18	16	24	1.5	75	84	29	34	46	2.8	140	55	95	40	50	85	325-475[h]	g
427	Burnside silt loam	46	16	16	27	1.7	85	82	29	36	48	3.3	165	50	95	45	50	95	325-475[h]	g
428	Coffeen silt loam	78	26	28	53	3.1	155	120	41	48	69	4.7	235	85	135	50	90	135		
429	Palsgrove silt loam[d]	52	18	19	35	2.2	110	85	30	37	52	3.7	185	60	100	40	60	105	325	1.4
435	Streator silty clay loam	78	26	24	52	2.8	140	112	41	47	70	4.4	220	85	130	45	80	125		
442	Mundelein silt loam	80	29	31	58	3.4	170	123	40	50	79	5.0	250	95	140	45	95	140		
443	Barrington silt loam	75	26	28	55	3.0	150	113	38	48	77	4.9	245	85	130	45	85	135		
448	Mona silt loam	60	19	20	39	2.3	115	100	34	44	67	4.1	205	65	115	50	65	115	300	1.5
451	Lawson silt loam	86	30	31	57	3.5	175	130	42	52	73	5.1	255	95	145	50	95	145		
452	Riley silty clay loam	71	22	24	45	2.7	135	100	35	46	66	4.2	210	75	115	40	75	120	425-575[h]	g
453	Muren silt loam	72	22	24	c	2.8	140	109	35	48	c	4.6	230	75	125	50	75	125	400	2.0
454	Iva silt loam	75	24	25	c	2.9	145	118	36	48	c	4.7	235	80	130	50	80	130	350	1.7
456	Ware silt loam	70	21	23	47	2.6	130	98	34	44	63	4.1	205	75	115	40	75	115	450-600[h]	g
460	Ginat silt loam	56	19	18	30	1.9	95	92	32	39	56	3.5	175	60	105	45	55	100	225	1.2
461	Weinbach silt loam	61	19	21	36	2.3	115	98	35	46	64	4.1	205	65	115	50	65	115	275	1.4
462	Sciotoville silt loam	59	18	20	34	2.2	110	94	32	41	58	3.9	195	65	105	40	65	110	325	1.6
463	Wheeling silt loam	53	17	19	32	2.1	105	90	29	38	54	3.7	185	60	100	40	60	105	350	1.8
465	Montgomery silty clay	63	21	19	32	2.2	110	100	35	41	58	3.8	190	70	115	45	65	105	225	1.0
467	Markland silt loam[de]	42	13	15	24	1.5	75	72	27	36	54	3.0	150	45	85	40	45	90	200	1.3
469	Emma silty clay loam	61	22	21	35	2.3	115	100	32	39	53	3.8	190	70	110	40	65	105	275	1.3
470	Keller silt loam[d]	55	18	19	35	2.1	105	80	28	35	49	3.5	175	60	90	30	60	100	200	1.2
471	Bodine cherty silt loam[fe]	g	g	g	g	.9	45	g	g	g	g	1.6	80	g	g		25	45	150	.9
474	Piasa silt loam	45	15	16	23	1.7	85	67	25	32	44	2.8	140	50	80	30	50	85	125	.6
475	Elsah cherty silt loam	55	19	18	35	2.3	115	95	34	43	61	4.1	205	60	110	50	65	115	425-575[h]	g
481	Raub silt loam	87	30	31	60	3.5	175	135	46	55	84	5.5	275	100	155	55	100	155		
482	Uniontown silt loam	65	20	21	43	2.6	130	104	32	43	58	4.4	220	70	115	45	70	115	325	1.5
484	Harco silt loam	86	30	32	58	3.4	170	134	43	54	79	5.1	255	100	150	50	100	150		
490	Odell silt loam	84	28	29	55	3.3	165	124	44	53	79	5.1	255	95	145	50	95	145		
495	Corwin loam	78	23	24	50	2.9	145	115	40	51	75	4.8	240	85	135	50	85	135		
496	Fincastle silt loam	70	22	24	45	2.7	135	114	37	48	66	4.5	225	75	125	50	75	125	300	1.4
497	Mellott silt loam[d]	65	20	22	43	2.6	130	105	36	46	63	4.3	215	70	120	50	75	125	375	1.8
504	Sogn silt loam[fe]	g	g	g	g	.9	45	g	g	g	g	1.6	80	g	g		25	45	100	.5
505	Dunbarton silt loam[fe]	30	10	12	23	1.4	70	57	19	25	38	2.6	130	35	65	30	40	75	200	1.0
506	Hitt silt loam[d]	56	20	21	37	2.3	115	85	33	37	54	3.7	185	65	100	35	65	105	350	1.5
513	Granby loamy fine sand	50	19	21	30	1.8	90	80	27	33	52	3.0	150	60	90	30	50	85	125	g
525	Darwin silty clay loam	62	20	18	32	2.0	100	100	33	37	51	3.5	175	65	110	45	55	100	375-525[h]	g
531	Markham silt loam[d]	51	17	17	32	2.0	100	88	31	39	57	3.7	185	55	100	45	55	105	300	1.4
535	Wedron silt loam	67	22	22	48	2.7	135	104	36	46	70	4.2	210	75	120	45	75	120	300	1.5
546	Keltner silt loam[d]	54	18	19	37	2.2	110	86	31	38	50	3.7	185	60	100	40	60	100	325	1.4
547	Eleroy silt loam[d]	46	16	17	31	1.9	95	80	28	34	46	3.4	170	50	90	40	50	90	275	1.2
549	Marseilles silt loam	55	18	19	35	2.1	105	88	30	37	54	3.5	175	60	100	40	60	100	250	1.1
551	Gosport silt loam[fe]	g	g	g	g	.7	35	g	g	g	g	1.4	70	g	g		20	40	100	.6
554	Kernan silt loam	57	19	19	39	2.2	110	94	34	44	62	3.9	195	65	110	45	65	110	275	1.4
560	St. Clair silt loam[de]	32	12	13	22	1.4	70	62	25	32	44	2.8	140	40	75	35	40	80	225	1.2
564	Waukegan silt loam[d]	58	19	22	37	2.3	115	92	26	38	55	3.8	190	65	100	35	65	110	325	1.6
565	Tell silt loam[d]	47	16	18	30	2.0	100	83	24	30	47	3.3	165	55	90	35	55	95	300	1.5
567	Elkhart silt loam	69	20	22	43	2.6	130	115	35	46	66	4.6	230	75	125	50	75	130	350	1.7
572	Loran silt loam[d]	57	19	20	39	2.3	115	90	32	39	52	3.8	190	65	105	40	65	110	300	1.3
576	Zwingle silt loam	47	16	15	28	1.7	85	80	30	36	53	3.4	170	50	95	45	50	95	225	1.3
581	Tamalco silt loam[e]	41	14	15	c	1.6	80	61	22	30	c	2.6	130	45	75	30	50	80	150	.7
583	Pike silt loam[d]	54	17	19	c	2.2	110	92	31	43	c	4.1	205	60	110	50	65	115	350	1.7
584	Walshville loam[de]	30	10	11	c	1.1	55	48	17	23	c	2.0	100	35	60	25	35	65	75	g
585	Negley loam[de]	40	13	15	c	1.7	85	77	25	37	c	3.3	165	45	90	45	50	95	225	1.3
586	Nokomis loam	69	24	25	47	2.8	140	110	37	47	65	4.4	220	80	125	45	80	125	325	1.5
587	Terril loam	75	26	27	54	3.0	150	119	39	50	70	4.8	240	85	135	50	85	135		
589	Bowdre silty clay	68	22	23	46	2.5	125	101	34	41	59	3.9	195	75	115	40	70	110	400-550[h]	g
590	Cairo silty clay	71	23	22	40	2.4	120	103	36	38	55	3.8	190	75	115	40	70	110	375-525[h]	g
594	Reddick silty clay loam	84	27	25	53	3.0	150	123	44	49	74	4.8	240	90	140	50	85	135		
616	Celina silt loam	62	21	22	40	2.6	130	107	37	43	63	4.3	215	70	120	50	75	125	325	1.5
617	Otterbein silt loam	73	23	24	48	2.8	140	117	39	48	73	4.6	230	80	130	50	80	130	300	1.4
633	Traer silt loam	66	21	20	42	2.3	115	108	35	43	62	4.1	205	70	120	50	65	115	300	1.2
656	Octagon silt loam[d]	64	19	20	41	2.6	130	99	35	43	62	4.2	210	70	115	45	75	120	325	1.5
660	Coatsburg silt loam[de]	34	12	14	25	1.4	70	65	21	26	40	2.7	135	40	70	30	40	75	150	.9
683	Lawndale silt loam	89	30	31	60	3.5	175	136	45	54	79	5.3	265	100	150	50	100	150		
684	Broadwell silt loam	84	28	30	58	3.4	170	126	40	51	76	5.1	255	95	140	45	95	145		
685	Middletown silt loam[d]	55	19	20	37	2.1	105	92	28	42	58	3.9	195	60	100	40	60	110	350	1.6
696	Zurich silt loam	60	19	20	42	2.5	125	102	34	43	63	4.3	215	65	115	50	70	120	300	1.6
697	Wauconda silt loam	72	25	27	51	3.0	150	112	37	47	73	4.7	235	80	125	45	85	130	300	1.4
698	Grays silt loam	68	22	24	47	2.8	140	108	36	45	70	4.5	225	75	120	45	80	125	325	1.7
706	Boyer sandy loam	46	17	18	28	1.9	95	74	26	31	48	3.2	160	55	85	30	55	90	175	1.1
723	Reesville silt loam	70	22	23	47	2.8	140	114	36	47	65	4.6	230	75	125	50	75	125	300	1.4
731	Nasset silt loam[d]	58	19	20	40	2.3	115	86	31	38	55	3.7	185	65	100	35	65	105	350	1.5
732	Argo silt loam	75	25	26	55	3.0	150	120	39	48	69	4.6	230	85	135	50	85	130		
743	Ridott silt loam[d]	53	18	19	36	2.1	105	81	31	35	50	3.6	180	60	95	35	60	105	275	1.2
745	Shullsburg silt loam[de]	49	17	18	33	2.0	100	78	30	34	48	3.2	160	55	90	35	55	90	200	1.0
746	Calamine silt loam	56	19	19	32	2.1	105	95	36	40	58	3.7	185	60	110	50	60	105	200	.9
752	Oneco silt loam[d]	51	18	19	33	2.1	105	80	30	34	49	3.5	175	60	95	35	60	100	325	1.4
753	Massbach silt loam[d]	50	17	18	34	2.0	100	77	30	34	48	3.4	170	55	90	35	55	95	300	1.3

(Footnotes on page 13.)